

Medicine  Health
RHODE ISLAND

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—♦—
**SPECIAL ISSUE:
FORENSIC PATHOLOGY, PART 1**

What's in a Name???

GOOD - authentic, honest, just, kind, pleasant, skillful, valid

NEIGHBOR - friend, near

ALLIANCE - affiliation, association, marriage, relationship

CORPORATION - company, business establishment

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Rhode Island Rooster, by Mary Jane Begin, a Barrington artist who designed this image for *R is for Rhode Island Red*, (Sleeping Bear Press) an alphabet book showcasing the state's most famous landmarks and institutions, written by her and her husband, Mark R. Allio. Ms. Begin teaches in the Illustration Department of the Rhode Island School of Design. The book will be released as part of a three-week original art exhibition, "The Art of the Book", at the Providence Art Club from October 30–November 17, 2005. www.maryjanebegin.com

Reach Out and Read Rhode Island (RORRI), the state coalition of the national, non-profit organization whose mission is to promote literacy through a network of pediatric care providers, is hosting a "Salón de Arte" style fundraiser at the Providence Art Club on **Friday, November 4, from 5:30-8:30 pm**. To reserve tickets, contact RORRI at 401-521-1266 or reachoutandread-ri@cox.net. Guests will be invited to tour the galleries and have copies of *R is for Rhode Island Red* signed. The reception is open to the public.

Medicine  Health
R H O D E I S L A N D

PUBLICATION OF THE RHODE ISLAND MEDICAL SOCIETY

COMMENTARIES

296 EVERY SILVER LINING HAS A CLOUD

Joseph H. Friedman, MD

297 A BALANCE BETWEEN GOOD AND EVIL

Stanley M. Aronson, MD

CONTRIBUTIONS

SPECIAL ISSUE: FORENSIC PATHOLOGY, PART 1

Guest Editor: Barry W. Wall, MD

298 INTRODUCTION

Barry W. Wall, MD

298 RHODE ISLAND OFFICE OF THE STATE MEDICAL EXAMINER:

PATHOLOGY IN THE PUBLIC INTEREST

Elizabeth A. Laposata, MD

304 ADULT FORENSIC PSYCHIATRY IN RHODE ISLAND

Barry W. Wall, MD

308 FORENSIC ODONTOLOGY AND THE POSTMORTEM IDENTIFICATION PROCESS

Stephen J. Puerini, DMD

310 CHILD AND ADOLESCENT FORENSIC PSYCHIATRY IN RHODE ISLAND

Joseph V. Penn, MD, CCHP

318 FORENSIC PEDIATRICS

Christine E. Barron, MD, and Carole Jenny, MD, MBA

COLUMNS

321 HEALTH BY NUMBERS

RHODE ISLAND CHILD DEATH REVIEW KEY FINDINGS: 2000-2002 DEATHS

Elizabeth A. Laposata, MD, Jennifer Swartz, DO, Wendy Verhoek-Ofstedahl, PhD, Andrea Alvarez, Edward F. Donnelly, RN, MPH, and Jay S. Buechner, PhD

323 PUBLIC HEALTH BRIEFING

RHODE ISLAND'S CHILD DEATH REVIEW TEAM

Elizabeth Laposata, MD, and Wendy Verhoek-Ofstedahl, PhD

326 BOOK REVIEW: VASCULAR DEMENTIA, CEREBROVASCULAR MECHANISMS AND

CLINICAL MANAGEMENT. EDITED BY ROBERT H. PAUL, PhD,

RONALD COHEN, PhD, BRIAN R. OTT, MD, STEPHEN SALLOWAY, MD

Reviewed By Janet Wilterdink, MD

327 QUALITY PARTNERS

THE GENESIS PROJECT: CULTURE CHANGE AT THE MIRIAM HOSPITAL

Lynn McNicoll, MD, FRCPC, Lisa Baumhover, MSN, RN, Phyllis J. McBride, MS, RN

329 A PHYSICIAN'S LEXICON: THE HEART OF THE MATTER

Stanley M. Aronson, MD, MPH

330 RHODE ISLAND MEDICAL JOURNAL HERITAGE

330 VITAL STATISTICS

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COMMENTARIES

EVERY SILVER LINING HAS A CLOUD

Humans are endlessly creative yet predictable. I am reminded of this after reading a report describing the result of a survey performed in New York to better understand improved results of angioplasty in coronary artery disease.

The state of New York decided that angioplasty results might improve if the doctors performing the procedures had their feet held to the fire, so to speak. The state would publish results of angioplasties by all doctors within the state, thus presumably forcing the ones with worse outcomes either to give it up or improve, since their business would evaporate when evidence showed they weren't too good at this potentially dangerous procedure. The notion that publishing results would make a difference would also be put to the test. And, amazingly enough, it did make a difference. The results got better.

However, to better understand why the results improved, New York sent out an anonymous survey to all doctors performing angioplasty. The results are probably what you, the reader, would expect. It wasn't that the bad doctors gave up the procedure. The benefits derived from doctors giving up the bad patients. Risky patients were referred for bypass surgery, or left to "best medical care."

Now there are two possible interpretations for this. One is that patients who shouldn't have had the procedure were spared a risky intervention. But the actual explanation was that doctors didn't want to bring down their batting average. If you are playing baseball and can choose whether to bat against Roger Clemens or Joseph Friedman, you're going to choose me.

This issue has always been in the foreground when "best hospitals" lists are published. A survey looks at parameters such as recovery time, complication rate, and cost, for standard diagnoses, not accounting for the fact that the very best hospitals are referred the worst cases because the community hospitals aren't equipped to handle them. In

the case of angioplasty, I doubt that the basic issue is ethics. I doubt that someone says, "He's too risky. He'll bring down my numbers." No, it is much more likely that the perception of risk changes. A case that previously was deemed fairly risky now becomes too risky because another factor beyond age, diabetes, hypertension, general health status has been added to a very long list of risk factors. Losing a case and the income it brings is now counterbalanced by the fact that each case carries potential baggage, increased risk. In the NY survey, doctors admitted that they started refusing cases that they formerly had accepted, because of the scrutiny.

In some ways this is analogous to "DRG creep" in which doctors, to enhance collections when payment is linked to a diagnosis code, increase the level of severity of the diagnosis. The city of Houston, Texas, improved its percentage of high school students who attended college by discounting the drop-outs. Statistics don't lie but we lie with statistics. But there is a large difference here. Doctors have altered their treatment based on an external review that has little to do with quality. Imposition of an "objective" assessment tool has potentially reduced the quality of medical care. Imagine if cardiac surgeons refused the high risk cases, the best doctors who exult in getting the most challenging cases, suddenly get singled out as being the "worst" doctors because their death rates are the highest in the area, the oncologist or AIDS doctor, "evaluated" not by peers but instead by an "instrument" that "objectively" assesses "quality" based on "numbers," not patients.

Every once in a while I get a letter from one of the insurance companies to let me know how I rate in terms of drug costs compared to my peers. I guess the idea is to let us know whether we are using drugs too freely, or perhaps to let us know that our colleagues use fewer expensive drugs; but it is a bizarre exercise when I find out that

my average costs are much higher than my colleagues because almost all of my patients have Parkinson's disease and take PD medications, often several of them. How this compares to the neurologist who manages the more typical patient with back-pain, headaches and dizziness is like comparing apples and oranges. Sometimes the letters ask if I find the information useful. While I never do, I don't think this keeps me from getting another letter in a few months.

I do think quality control is important, but surveys and numbers rarely capture it. Completely documenting everything ("if it's not documented, it didn't happen") sounds better than it is. I'm sure that evaluating doctors' charts to check for glucose measures, vaccinations, counseling on smoking, and a variety of public health measures does make a difference in public health. On the other hand I see computer-generated notes that tell me that a patient seen by a neurosurgeon had no skin complaints, slept on one pillow and didn't drink alcohol or use drugs. The score on some quality of life measure was terrific, but I couldn't find out why the patient saw the doctor or what had happened in the office.

Anything can be subverted. We need to be careful that our quality control mechanisms don't wreck the very quality they were designed to measure. Improving angioplasty results by changing the criteria for patient selection is like letting insurance companies insure only the healthy.

JOSEPH H. FRIEDMAN, MD



A BALANCE BETWEEN GOOD AND EVIL

Applied chemistry progresses by one of two major avenues. Usually a commercial need is identified and laboratories are urged to find a chemical to fulfill this need. This is the conventional pathway which starts with a need, then seeks a solution.

But then there is a second way in which laboratories might contribute to society's wants. In the laborious process of seeking answers, many new products may be synthesized, some with no immediate purpose; and so these orphan products are stored in the hope that a use may some day be found. They represent answers seeking questions.

For example, consider the convoluted history of aspirin. In 1757 an English cleric, the Rev. Edward Stone, found that the bark of the English willow tree [*Salix alba*] possessed a wondrous characteristic: it tended to reduce fevers, allay headaches and diminish the pains of aging joints. Half a century later, a German chemist named Buchner isolated the therapeutically active ingredient in willow bark, calling it salicin [from the Latin name of the willow, *Salix*]. It functioned as Rev. Stone had claimed, but it also caused distressing side effects. Commercial chemists then synthesized numerous analogs of salicin in the hopes of reducing its unwanted effects. Most of these newer chemicals were never clinically tested. Thirty years later, Felix Hoffmann, a chemist in the Bayer factory in Germany, was seeking a medication to diminish the arthritic pains suffered by his ailing father-in-law. The storage shelves of the Bayer laboratories were congested with countless chemical variants of salicylic acid, including an untested product called acetylsalicylic acid. This proved to be both efficacious and only minimally toxic for Hoffmann's father-in-law; and 600,000 tons of this product, now called aspirin, are consumed annually by Americans.

In the 1930s, a German chemist named Zeidler synthesized a colorless, odorless chemical called dichlorodiphenyl-trichloroethane. Later, Paul H. Muller, a biochemist working for the Swiss pharmaceutical company, J.R. Geigy, was seeking insecticides which did not rapidly degrade. His search was prompted by a recent infestation of Colorado potato beetles causing extensive damage to Europe's crops.

Rockefeller Foundation scientists were aware of the many mosquito-borne diseases, such as malaria, dengue and encephalitis, endemic to the islands of the southwestern Pacific, islands shortly to be the battlegrounds involving American troops. And so, in 1943, the Foundation commenced a series of field tests searching for an efficient insecticide, lethal to both larvae and adult mosquitoes, which could be spread by aircraft. Among the many chemicals field-tested was Muller's insecticide, dichlorodiphenyl-trichloroethane [now called DDT]. The chemical was tested by aerial spray in northern Mexico, and the incidence rate of malaria dropped precipitously in the sprayed region. Furthermore, the scientists noted that the insecticide remained effective for months.

Aerial spraying of DDT became a standard procedure

preceding each island invasion in the Pacific theater of operations. Countless lives were saved by these preventive measures; and DDT also proved to be effective against ticks and mites, carriers of tropical typhus.

Allied troops invaded Europe in 1943, first through the island of Sicily, followed shortly by landings on the Italian mainland. Four years of war had caused a breakdown of public health systems, and major Italian cities such as Naples were subject to the pestilence called epidemic typhus, a bacterial disease spread by the bite of body lice. The United States Army Medical Corps devised a system, employing the exhausts of vacuum cleaners, to blow powdered DDT up the sleeves, pant legs and dresses of the Naples citizenry; and within a week the typhus epidemic was brought under control.

By 1946 entire regions of the world, such as the island of Sri Lanka and most of Indonesia, were made malaria-free by aerial spraying of DDT. DDT spraying of the cotton fields of this nation as well as in Egypt increased the harvest yield tremendously. And by 1950, DDT, recklessly sprayed over much of the world, was ranked with penicillin as mankind's greatest blessing.

1960 represented the turning point in popular acceptance of DDT. A 1962 text by Rachel Carson, *Silent Spring*, documented the unintended effects of DDT upon the predatory bird population [eagles, falcons and kestrels]. Small rodents, such as field mice, ate crops covered with DDT. These small creatures, now saturated with DDT, were then eaten by large birds; and the DDT caused a defect in the shell-forming tissues of the females. Eagle eggs became too fragile and the new-born population of eagles and other aviary predators diminished. There was some preliminary evidence, too, that DDT might be causing birth defects and even cancers [although more comprehensive epidemiological data collection later ruled out these side effects].

The United States banned the use of DDT in 1972 and even threatened economic reprisals upon Third World nations which persisted in its use. In Africa, where DDT spraying had ceased, the incidence of malaria rose dramatically; and only now, with sprayings judiciously confined to residential walls and nettings, are these rates falling again.

Each humanly contrived action, each intervention, will cause unintended consequences: some immediate, some delayed; some negligible, some beneficial – and some catastrophic. But no pebble dropped in the pond of life will be without ripples. Those blessed with uncommon wisdom will therefore weigh the good, the bad and the imponderable before intervening. DDT has saved more lives, in the 20th Century, than any preventive intervention with the possible exception of smallpox vaccination. Yet DDT has also despoiled countless ecological settings. In malaria-free, ecologically-zealous America, DDT is regarded as a poison. In Africa it is salvation.

STANLEY M. ARONSON, MD

INTRODUCTION

BARRY W. WALL, MD

This is the first of two editions of *Medicine & Health/Rhode Island* that spotlight forensic medicine. This specialized area of medical practice helps the law investigate, understand and deal with the causes of a person's disease, injury or death. The applications of forensic medicine range from child abuse to murder and death from violations of civil rights. In the practice of their various subspecialties, forensic medical professionals assist the legal system in the pursuit of justice, assess and provide treatment of persons in the criminal justice system, and protect the public from various hazards.

In these editions, Rhode Island's major forensic professionals have written articles that describe their work. This edition describes forensic pathology, forensic odontology, child and adolescent forensic psychiatry, and child forensics. The second edition will cover forensic ethics and the medical care of inmates at the Adult Correctional Institutions. I hope that these editions increase all physicians' awareness of the work that forensic professionals do in our state and provide a greater understanding of the need for all types of forensic services.

CORRESPONDENCE:

Barry W. Wall, MD
184 Waterman Street
Providence, RI 02906
E-mail: bwall@mhrh.ri.gov

Barry W. Wall, MD, is Director, Forensic Service, Eleanor Slater Hospital, is in private clinical and forensic psychiatric practice and is Clinical Associate Professor, Department of Psychiatry and Human Behavior, Brown Medical School.

RHODE ISLAND OFFICE OF THE STATE MEDICAL EXAMINER: PATHOLOGY IN THE PUBLIC INTEREST

ELIZABETH A. LAPOSATA, MD

"We provide answers to sudden unexpected violent death in the community."

"We protect the public health and safety."

"We preserve evidence for the government and for families."

"We stand ready to help families through their grieving process."

Rhode Island General Law Title 23 Chapter 4 and Title 23 Chapter 1-1 establishes the Medical Examiners Office in the Department of Health and mandates that it investigate all deaths in Rhode Island that are sudden, unexpected, unexplained, or involve injury. Medical doctors with postgraduate training in anatomic pathology and subspecialty training in forensic pathology lead the investigation. Forensic pathology directs its efforts to the examination of living or dead persons to provide

an opinion concerning the cause, mechanism, and manner of disease, injury, or death; the identification of unknown persons; the significance of biological and physical evidence; and the correlation and reconstruction of wounds, wound patterns, and wound sequences. The forensic pathologist aids public health, public safety, quality assurance, medical education, and the administration of justice.¹ Our goal is to develop strategies to prevent injury, disease, and death - to have the dead help the living.

HISTORICAL ORIGINS

The office of medical examiners originated in 9th Century England in the office of the "Crown" (hence, the term coroner).² The King dispatched the "Crown" to "investigate" death scenes and determine whether the King could claim or tax the deceased subject's belongings. When coroner laws came to the American British colonies, coroners were elected officials (usually not even medical doctors). The first

move toward a medical examiner system occurred in 1860 when Maryland legislated the presence of a physician at the death scene. Modern death investigation systems evolved from a decentralized, local coroner practice to the current medical examiners system, led by physicians trained in forensic pathology.

HOW DEATHS ARE REPORTED IN RHODE ISLAND

In Rhode Island, the Office of the State Medical Examiner investigates any death involving injury (whether minor or major, recent or remote), as well as death that is sudden, unexpected at that time, or unexplained. Specific reportable deaths and occurrences established by Rhode Island law are listed in Table 1.

To report a death, call the Medical Examiner Office Hotline [401-222-2948], in operation 24 hours a day, 365 days a year. Anyone having knowledge of a possible unnatural death may report it. Usually, physicians and law

Table 1

Reportable Deaths and Occurrences
Death after abortion
Death from disease following injury
Death during or after anesthesia or a therapeutic, diagnostic or surgical procedure
Fetal death without medical attendance
Death from job-related injury
Death in custody (State or law enforcement)
Death from injury or violence
Death while in apparent good health
Death in public places (parks, public buildings, aircraft, ships)
Death from contagious disease or agent
Death from drugs/poisons/chemicals
Suspected anatomic material
Death of newborn infants
In-hospital death that involved any of the above
Deaths within 24 hours after admission to hospitals or other healthcare facilities, all dead on arrivals, and all emergency room deaths
All deaths where organ or tissue donation is desired by the individual or family
All deaths under 18 years of age regardless of cause [Gen laws 4-7(2e)]*
* This allows a complete database of all deaths of individuals of less than 18 years of age in Rhode Island to facilitate comprehensive child fatality reviews by the Medical Examiners Office

enforcement personnel are the primary reporters. However, funeral directors or relatives occasionally report concerns about a potentially non-natural death.

INITIAL CALLS AND CLASSIFICATION OF THESE CALLS

Medico-legal investigators staff the office around the clock to assess potential jurisdiction as outlined in Table 1, respond to the death scene if required, supervise the transport of the deceased to the Medical Examiners Office and prepare an initial narrative report. There are three potential outcomes of the initial call: jurisdiction accepted; jurisdiction accepted *In Absentia* (meaning absent the body); and jurisdiction declined.

If the Medical Examiner accepts jurisdiction, a full medico-legal death investigation will occur; and the Medical Examiner must sign the death certificate. If a reportable death is under Medical Examiner jurisdiction, no further manipulations of the body or examinations should be conducted and all lifesaving medical devices and/or resuscitative or therapeutic items

must be left in place. The deceased is transported to the Medical Examiners Office. The cause of death will be determined to a reasonable degree of medical certainty and findings entered on the death certificate. In most but not all cases, an autopsy is performed. For example, a death due to hanging may require only an external examination,

Table 2
Death Investigations by Office of State Medical Examiners

Case Type	2000	2001	2002	2003	2004
Autopsy	518	687	688	865 ²	699
In absentia	135	196	271	286	296
After-the-fact determination ¹	46	54	47	24	37
Cremation review ³	2161	3026	3043	2684	2613
Investigation report only	1681	2140	2249	2146	2040
Total OSME cases	4541	6113	6298	6005	5685
Total Deaths in RI	10142	10119	10450	10219	9921

¹After the fact refers to deaths requiring investigation after a death certificate filed in error by a non-medical examiner physician
²96 autopsies related to "Station night club fire" –February 20, 2003
³medical examiners certify death certificates prior to cremation to ensure the cause of death & that there are no public health or safety implications

but only if the scene investigation reveals no evidence of foul play and the decedent's medical, psychiatric and social history provides evidence of potential motive and means for suicide. Further, the external examination of the body must show nothing suspicious or the potential for another mode of death. The Medical Examiner determines on a case-by-case basis whether the case requires an external examination only, a limited or full internal examination, or other procedures and testing to certify the cause and manner of death.

With "Jurisdiction accepted *In Absentia*" the Medical Examiner has determined that a postmortem examination was not required to determine the cause of death. This occurs when the scene investigation and interviews of witnesses, families, and others and discussions with law enforcement reveal no need for an autopsy. Typical cases include elderly persons with probable natural disease processes who die at home, or traumatic deaths after prolonged hospitalization due to non-homicidal injury. These cases usually have sufficient diagnostic testing results and hospital records to determine the cause of death. In these situations, all records are reviewed by the Medical Examiner. The deceased can be released directly to the funeral home, and the funeral director obtains the death certificate from the Medical Examiner.

Table 3

Benefits and Uses of the Medicolegal Postmortem Examination
Assure medical and surgical standard of care
Eliminate suspicion and substitute facts for conjecture
Facilitate legitimate and mitigate frivolous litigation
Confirm and clarify diagnoses and evaluate the accuracy of medical diagnostic procedures
The autopsy is the ultimate medical consultation for families and clinicians
Provide reassurance and information to surviving families
Facilitate the grieving process and closure for survivors
To aid in the discovery of new or previously unrecognized diseases (ex: AIDS, Legionella)
To act as a sentinel agency for the determination of deaths due to bioterrorism
Identify unsuspected crimes and initiate other investigations
Facilitate police investigations and criminal prosecution
Aid in assessing the suitability of the deceased for organ and tissue donation when possible
Provide objective examinations and opinions in public and semi-private agency deaths in order to maintain public confidence (ex. police custody, prison deaths, mental and psychiatric institutions, nursing homes)
Provide information for insurance and estate issues

“Jurisdiction declined” means that the case was within reportable guidelines but investigation did not reveal evidence of an unexpected, unnatural, or violent death. A medical examiner’s investigation report is completed, but the treating physician is allowed to complete the death certificate. A typical non-jurisdiction case is a death occurring during a surgical procedure where the patient was at high risk and there were no difficulties or mishaps during the procedure; e.g., death during emergency surgery for a ruptured abdominal aortic aneurysm.

THE VOLUME OF INVESTIGATIONS

The Office of the State Medical Examiner responds to approximately 6,000 calls for service per year. (Table 2)³ We determine the cause and manner of death in approximately 1,000 death investigations per year; over two-thirds require autopsy. A small percentage of investigations occur after a non-medical examiner physician filed the death certificate in error. These “ after-the-fact” investigations decreased from about 50 in 2000 to 37 in 2004, due in part to improved reporting practices by physicians and law enforcement.

In 2004, there were 535 sudden, unexpected deaths from natural disease

processes; 497 deaths were classified as non-natural. These non-natural deaths included 83 suicides, 36 homicides, 73 drug-related deaths, 9 undetermined causes of death (some due to family objection to autopsy), and 296 deaths as the result of other accidental trauma such as falls and drowning, including 100 motor vehicle accidents.

MEDICO-LEGAL DEATH INVESTIGATION

The medico-legal death investigation seeks to determine the cause of death, the manner of death, and the circumstances surrounding the death.⁴ Even though the autopsy may be completed in a few hours and the deceased released to the funeral home, the autopsy is only one part of the entire investigation. That investigation involves evaluation of the death scene, medical records and history when available, facility incident reports, other official investigative reports (e.g., police, fire marshal, DEM, OSHA), and requesting and evaluating laboratory tests and diagnostic procedures. The medical examiner may order ancillary tests; e.g., radiology; toxicology to detect illicit, over-the-counter and prescription drugs and poisons; virology, microbiology and parasitology studies; electrolyte determinations; genetic testing for undiagnosed heritable conditions

(such as metabolic abnormalities in infant death); and neuropathology, histology, and other specialized testing (such as tryptase levels to diagnose anaphylactic reactions or endocrine function panels).

Only the Medical Examiner can sign death certificates for non-natural deaths (homicides, suicides, and accidents). The final product is the postmortem examination report, which is, in a sense, the last medical evaluation that the individual will have. It consists of the external and internal examinations, procedures and specimens, laboratory results, final diagnoses, cause and manner of death, a narrative summary of the case and medical references, if appropriate. The benefits and uses of the postmortem report are described in Table 3.⁵ The reports are confidential. The State requires a \$30 fee and a request in writing to obtain a copy of the report.

Records received from outside sources are not re-released to any party and must be obtained from the original source. The forensic pathologist will come to as prompt a decision as the facts and circumstances allow, or readily explain the time required for other testing and study.

THE MEDICO-LEGAL AUTOPSY

For an individual under a physician’s care dying of disease in a hospital, hospital pathologists perform an autopsy only when permission is obtained from the next of kin. The hospital pathologist assesses clinico-pathologic correlations, supports medical education and contributes to medical research on disease and treatments depending on family wishes. The disease process and cause of death are rarely a mystery.

The goals of the forensic autopsy are different from the hospital autopsy because the law mandates that it be performed in cases where the cause or circumstance of death may be other than natural. Next- of-kin permission is not required. Surgical incisions do not alter the appearance of the deceased and allow for embalming and viewing at the funeral home.^{6,7}

In some cases, the cause of death

Table 4
Key Components of the Cause of Death

Term	Definition	Comment
Proximate cause of death (synonyms: primary or underlying cause of death)	The disease or injury, which initiated the chain of events, no matter how short or prolonged, that resulted in death.	In the absence of this underlying cause, the individual would be alive today; must be specific and antecedent to other causes in regard to time and pathologic relationship.
Immediate cause of death	The disease, injury or event that directly precedes death	The final consequence of the proximate cause.
Mechanism of death	The physiologic or biochemical disturbance produced by the cause of death	How the cause of death exerts its effect; ex: bleeding, sepsis, respiratory failure, arrhythmia, and renal failure.
Manner of death	Explanation of the circumstances of how the cause of death arose	Natural or unnatural (homicide, suicide, accident, and undetermined)

may be obvious, such as a gunshot wound. But even in these cases, the postmortem examination helps reconstruct the circumstances of death and supports investigation by police. For example, establishing the tract of a gunshot wound through the body can determine whether any purposeful activities occurred after injury, or determine time to incapacitation, unconsciousness, and death. Thus, the victim of a gunshot wound whose autopsy showed that the bullet transected the spinal column would not be expected to run several blocks. Police use this information to assess the veracity of eyewitness reports. Moreover, the rifling marks on a projectile recovered at autopsy can be matched to a particular handgun, thus identifying the murder weapon. In other cases, the study and documentation of injury patterns can place individuals in specific positions as occupants of motor vehicles, fix the positions of pedestrians when struck, or determine how safety devices may have failed or were circumvented in workplace fatalities. When remains are decomposed or skeletonized, determining the cause of death and establishing positive identification can be challenging.

When the medico-legal postmortem examination preserves items of potential evidentiary value, the forensic pathologist initiates a chain of custody to transfer evidence; e.g.,

cardiac pacemakers, medication pumps, apnea monitors, child safety seats, and scuba diving equipment. Trace evidence collected from the body may include dried secretion, hairs, fibers, body fluids and tissue samples. Sample collection can include the use of an alternative light source or a postmortem sexual assault kit.

THE CAUSE OF DEATH AND MEDICO-LEGAL LOGIC

Death analysis is rarely addressed in medical school curricula. Important components in forensic pathology training include the acquisition of a medico-legal vocabulary and the ability to apply the concepts embodied in the vocabulary to the evaluation of autopsies.^{8, 9}

Clinicians may not understand fundamental terminology pertaining to cause of death. The cause of death is a series of physiologic events that creates an uninterrupted chain of events culminating in death. It has three parts: the mechanism, immediate cause, and proximate cause of death. (Table 4)

The manner of death explains how the cause arose, either natural or violent. While natural deaths are due exclusively to disease, violent deaths are due to accidents, homicides, and suicides.

The mechanism of death is the physiologic or biochemical disturbance produced by the cause of death. It is not etiologically specific

(e.g. exsanguination) and gives little information about what caused the death. For example, death from the terminal mechanism of a cardiac arrhythmia can be the result of such many immediate causes, such as a gunshot wound to the head or a myocardial infarction.

Immediate causes of death are the sequelae and complications of the proximate cause (discussed below) and its treatment. It is the disease, injury, or combination of both that is responsible for the fatality, and it should be etiologically specific. Examples are brain injuries, pneumonia, or myocardial infarction.

In some deaths, the immediate cause of death may be preceded by a proximate cause, which is the event that started the lethal chain of events, no matter how remote in time it may be from the immediate cause of death. A criterion for assessing the existence of and validity of a proximate cause of death is whether the individual recovered to a similar baseline of health and functioning as prior to the proposed proximal event. For example, if a person dies of pulmonary emboli two weeks after being non-ambulatory, the pulmonary emboli are not the *per se* cause of death. The proximate cause is the disease or injury responsible for the physical inactivity (e.g., a fractured femur due to blunt force trauma from a fall or an assault). The immediate cause of death is emboli arising from physical

Table 5

The Medical Examiner's Role in Public Health
Participate in infectious disease surveillance
Produce accurate, standardized death certificates for epidemiology application
Provide early identification of public health risks
Identify and report potentially 'treatable' community health problems (ex. seatbelt use, domestic violence, gang violence, child abuse, elder maltreatment, obesity)
Identify and report epidemiology's regarding at-risk activities (ex. co-sleeping, infant sleeping position and sudden death)
Identify and report product defects (Consumer Product Safety Commission through reporting to the Medical Examiner and Coroners Alert Project)
Identify and report adverse reactions to drugs and medication (ex. unanticipated effects of alternative and herbal medications, over-the-counter and prescription drugs)
Identify and report dangerous work and environmental conditions (ex, hazards of work in confined spaces, electrical safety)
Identify and report illegal drug use trends [both street and prescription drug use, particularly through participation in DAWN (Drug Abuse and Early Warning Network)]
Gather and retrieve data essential for public health policy changes (ex: bicycle and motorcycle safety laws, seatbelt use, graduated driving laws, handgun safety)

inactivity with ensuing deep vein thrombosis in the lower extremities. Thus, the complete cause of death correctly stated is cardiorespiratory arrest (mechanism) due to pulmonary emboli (immediate cause) due to blunt force trauma (proximate cause). The manner of death would be accidental if the blunt force trauma was the result of a fall; homicide, if the result of an assault.

THE MEDICAL EXAMINER AND THE GRIEVING PROCESS

Although our patients are deceased, the doctors at the Medical Examiners Office are available to assist families with their grief. A family bereavement packet is provided to the family via the funeral director when he/she takes custody of the deceased. The packet has information about managing grief, experiencing a death, talking to children about death, and bereavement support groups in Rhode Island. For families who have experienced the death of an infant, we provide a "Memory Keepsake" folder that contains a footprint and a lock of hair tied with a ribbon, which is again provided to the family via the funeral director.

THE MEDICAL EXAMINER AND PUBLIC HEALTH

In performing individual death investigations, the Medical Examiner obtains information whose aggregate

analysis holds potential for public health and intervention, as listed in Table 5.¹⁰

The Rhode Island Medical Examiners office is one of seventeen states funded by the **Centers for Disease Control and Prevention (CDC)** to participate in the National Violent Death Reporting System, which identifies local and national trends and factors pertaining to non-natural death. The Rhode Island Child Death Review Team studies characteristics of child deaths in Rhode Island to identify potentially preventable factors to keep children safe.

Medical examiners offices can detect unusual clusters of deaths or unusual individual deaths. For example, the Rhode Island Medical Examiners Office diagnosed the first death in New England caused by the Hanta virus, a virus found in the rodent population and usually confined to the Southwest United States.¹¹ In addition, Medical Examiner protocols have been developed to detect signs and symptoms of deaths from possible bioterrorist agents.¹²

THE MEDICAL EXAMINER IN COURT

The forensic pathologist can be asked to provide medical information in the legal setting.¹³ Unlike a fact witness, an expert witness is allowed to give expert opinions in his/her area of expertise to help the judge and jury

understand the evidence. The rules of evidence require that a medical examiner show that his/her testimony is based upon sufficient facts, data, and information about the case, that reliable and accepted methods were used to establish the facts in his/her area of expertise, and that the accepted scientific methods and principles were correctly applied to analyze the fact of the case.¹⁴

Medical examiners testifying as expert witnesses must present medical information in the legal arena. This can be a challenge, as the cultural differences between law and medicine are magnified at court, especially in the context of cross-examination. For example, an expert may be asked at court to give a yes-or-no answer to a question that requires a complex answer. Although the medical examiner often presents the conclusions of the death investigation at the request of the prosecution (in criminal matters), the facts presented are the same regardless of "which side" asks the questions. The expert must be objective and complete because the stakes are high. In criminal cases, the defendant faces a potentially long confinement, and in civil cases, important matters are decided such as those pertaining to malpractice, life insurance, workers compensation and equity actions.

CONCLUSION

The medical examiner speaks for

the dead – who are you, and what, when and how did your death happen? By providing answers to sudden, unexpected and/or violent death in the community, the medical examiner can bring comfort to families and use information obtained from death investigations to promote safe and healthy communities.

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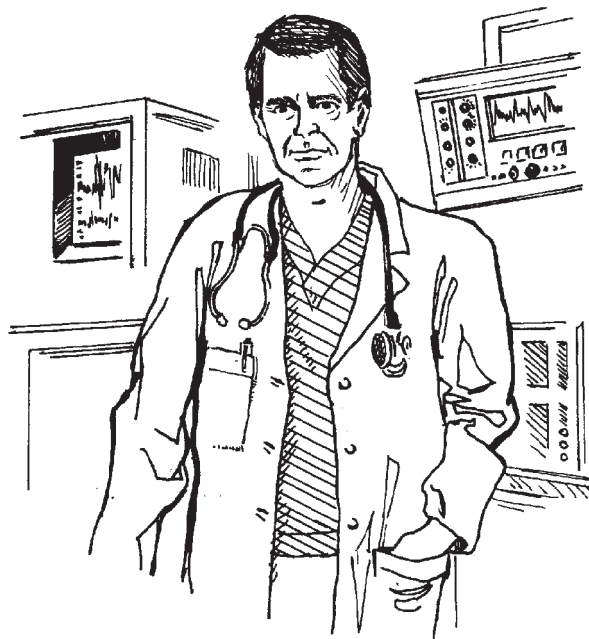
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Elizabeth Laposata, MD, is Clinical Associate Professor, Department of Pathology and Laboratory Medicine, Brown Medical School, President of Forensic Pathology & Legal Medicine, Inc., and the former Chief Medical Examiner for the State of Rhode Island.

CORRESPONDENCE:

Elizabeth Laposata, MD
Forensic Pathology & Legal Medicine, Inc.
209 University Ave
Providence, RI 029036
e-mail: Elizabeth_Laposata@Brown.edu



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ADULT FORENSIC PSYCHIATRY IN RHODE ISLAND

BARRY W. WALL, MD

The medical subspecialty of forensic psychiatry helps judges and lawyers understand psychiatric issues in legal settings. Although there can be some confusion and misunderstanding about psychiatry's involvement in the legal system, the law needs psychiatry to help answer certain questions. This article describes the most common situations in which psychiatrists become involved in Rhode Island's legal system. Adult forensic psychiatric matters that arise in the criminal law are discussed first, followed by a description of major psychiatric issues in non-criminal matters.

CRIMINAL LAW

Every state provides criminal courts with mental health evaluations of defendants whose mental status raises questions of competence to stand trial or accept criminal responsibility. However, the characteristics and types of these forensic evaluation services vary across the country.¹ Forensic evaluation and treatment services for the **Department of Mental Health, Retardation, and Hospitals (MHRH)** in Rhode Island are provided largely by the Eleanor Slater Hospital (the former Institute of Mental Health) with some of the evaluation and treatment occurring on an outpatient basis in conjunction with community mental health centers and other mental health service providers.

MHRH is responsible for evaluating and providing treatment for criminal defendants relative to issues of competency to stand trial, providing treatment for persons found **not guilty by reason of insanity (NGRI)**, and providing inpatient hospitalization for **Adult Correctional Institutions (ACI)** inmates who temporarily require hospital care. The Brown University Residency Program in Psychiatry and Eleanor Slater Hospital have a public-academic program that provides some of these forensic services to Rhode Island courts.

COMPETENCY TO STAND TRIAL

Competency to stand trial is the main issue that courts ask psychiatrists to address before a criminal case goes to trial. The psychiatrist assesses a defendant's present mental state, not his/her mental state at the time of the alleged offense. A defendant should understand the charges and allegations against him/her, understand the roles of courtroom personnel, and assist his/her attorney in his/her defense. Placing someone who lacks these abilities on trial violates the law's sense of fairness.

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MENTAL HEALTH
COURT.”**

The Forensic Service of Eleanor Slater Hospital is primarily responsible for conducting competency to stand trial evaluations. In Rhode Island, defendants referred for competency examinations are evaluated at either the ACI or on an outpatient basis if they are not incarcerated. Nationwide, approximately 60,000 screening evaluation requests of competency to stand trial are conducted annually.² In Rhode Island, the annual average is 150 screening evaluations.

From 70 to 90% of defendants nationwide are recommended to the court as competent to stand trial based on the results of the screening

evaluation.³ In Rhode Island an average of 80% of defendants are recommended to the court as competent to stand trial. The competent defendant typically remains at the ACI, or in the community if on bail, and returns to court for a resolution of the legal case unless the competency recommendation is contested. The remaining 20% of defendants recommended as incompetent to stand trial usually are admitted to the Forensic Unit of Eleanor Slater Hospital for care and treatment to restore them to competency. During this period, the criminal court proceedings are suspended until the defendant's competence to stand trial is restored. At that time, the defendant returns to court and the case resumes. At the Eleanor Slater Hospital, the defendant's treating psychiatrist is not the forensic competency examiner so as not to adversely affect the patient's treatment.

MENTAL STATUS AT THE TIME OF THE OFFENSE

Because mental state is the main way that the law grades culpability, understanding a defendant's state of mind at the time of the criminal incident is the primary issue that courts ask psychiatrists to address. While a criminal defendant can raise a number of defenses during the guilt determination phase of the process, the two major doctrines are the insanity defense and the diminished capacity defense. Both defenses require a reconstruction of the defendant's thought processes and behavior before and during the alleged crime. In contrast to competency to stand trial evaluations, evaluations of a criminal defendant's mental status at the time of offense are not the responsibility of MHRH's forensic services and are conducted in the private sector.

Not guilty by reason of insanity: In Rhode Island, a person is not responsible for criminal conduct if

his/her “mental disease or defect” substantially impairs his/her ability either to appreciate the wrongfulness of his/her conduct or to conform his/her conduct to the requirements of the law.⁴ Since legally “insane” persons lack criminal responsibility for their action, punishing them would compromise the moral integrity of the criminal justice system.

Nationally, 2.2 persons out of every 100,000 are being treated as NGRI inpatients.⁵ In Rhode Island, 1.2 persons per 100,000 are currently committed to MHRH as NGRI, although not all are in the hospital. In Rhode Island, an NGRI plea is usually entered for only the most serious charges, such as murder and attempted murder. The lower rate of NGRI findings in Rhode Island may be because defense attorneys resist an NGRI defense if a prison sentence would be shorter than a forensic commitment through MHRH. Laypersons may believe that too many criminals “beat the system” by pleading insanity, but this is not the case.

While insanity evaluations occur privately, once found NGRI, acquittees are committed to MHRH for treatment of their mental illness and remain committed until they are thought to be no longer dangerous to society. At admission, a risk assessment must be provided to the court. Typically, the acquittee poses some risk, and he/she remains in the hospital until his/her gradual release to the community is recommended by the MHRH Forensic Review Committee and approved by the court. Persons found NGRI who have been found to no longer pose a significant danger to society may ultimately be released to receive outpatient treatment from community mental health providers. This occurs only after court approval and is part of MHRH’s gradual release program through the Forensic Review Committee.

Diminished capacity: The law assigns less blame to a defendant who accidentally commits a criminal act than to one who deliberately commits one. The degree of culpability is at

the heart of a diminished capacity defense. Diminished capacity allows the defendant to introduce psychiatric testimony about his/her mental state without asserting an insanity defense.

In diminished capacity cases, the law addresses whether the defendant was incapable of forming the requisite intent when he/she committed an act, due to mental illness, drug or alcohol intoxication. While the language defining diminished capacity in Rhode Island is not straightforward,⁶ in essence the psychiatrist assesses whether the defendant was aware of the circumstances that made the conduct criminal and whether he/she intended to commit the act. For example, a defendant charged with first-degree murder may seek a reduction to manslaughter by using the diminished capacity defense. The psychiatrist would assess whether the defendant intended to commit murder at the time of the incident. If found guilty of manslaughter rather than murder, the defendant would receive a shorter sentence, and would be incarcerated at the ACI instead of committed to MHRH. Like the insanity defense, successful diminished capacity strategies are rare, both nationally and in Rhode Island.

TEMPORARY PSYCHIATRIC HOSPITALIZATION OF INMATES

A person’s psychiatric involvement does not end with the completion of the court case. The Department of Corrections is primarily responsible for the evaluation and treatment of mentally ill inmates, which is discussed in two companion articles.^{7,8} However, sometimes inmates cannot be treated in prison and must be hospitalized. This hospitalization occurs at the Eleanor Slater Hospital.

Inmates are transferred from the ACI to Eleanor Slater Hospital only upon court order after evaluation by a prison psychiatrist, who must demonstrate that the person needs specialized psychiatric services that cannot be provided in a correctional setting. After the inmate’s mental condition improves, he/she is transferred back to the ACI and receives

correctional mental health treatment.

ADDITIONAL COMMENTS

MHRH, District Court and the Department of Corrections have devised court-based and other programs to divert mentally ill offenders out of the criminal justice system and into the mental health system. Nonetheless, the limited resources make treatment challenging for those in the criminal justice system.⁹ Despite a collaborative, well-developed public system in Rhode Island that addresses the needs of the mentally ill in many stages of the legal process, there remains the need for continued reform to provide better assessment, treatment alternatives to jail, and closer follow-up of mentally ill persons whenever they are released from incarceration, courts, or forensic hospitalizations.

NON-CRIMINAL LAW

CIVIL COMMITMENT

“Civil commitment” refers to the state-sanctioned deprivation of liberty of an individual who needs psychiatric treatment. In Rhode Island, an individual can be committed to inpatient or outpatient psychiatric treatment when a judge determines that he/she poses a likelihood of serious harm to self or others, or poses a grave and clear risk to his/her physical health by reason of mental disability.¹⁰ Civil commitment forces an individual to stay in a hospital or to keep outpatient appointments, but does not allow for the involuntary administration of psychiatric medications. The procedure for overriding an individual’s refusal to take medication is called a Petition for Instruction, discussed below.

A person evidencing behavior deemed unacceptable to the community, or who repeatedly refuses to adhere to treatment or has had repeated psychiatric hospitalizations often triggers the commitment process. In Rhode Island, an individual can be involuntarily held at a hospital for up to ten days by emergency certification, a process that does not normally entail a legal proceeding. However, the court must approve long-term detention unless the individual agrees to a voluntary hospital stay. In addition

to inpatient commitment procedures, court-ordered outpatient treatment may be requested while the individual is either in a psychiatric hospital or residing in the community. A person placed on outpatient commitment must be committed to a community mental health center.

In Rhode Island, District Court judges hear civil commitment proceedings. By agreement with the District Court, hearings occur every Friday. The location alternates between St. Joseph's Hospital and Eleanor Slater Hospital. Over 200 civil commitment cases are heard every year. Lawyers from the MHRH Legal Office represent the petitioning psychiatrist/agency/hospital when the person subject to the commitment is a client of the public mental health system. The Office of the Mental Health Advocate represents the majority of individuals who are the subject of the petition.

By law, inpatient civil commitment is valid for six months unless the individual is discharged beforehand. Outpatient civil commitment is valid for six months. Civil commitment orders may be recertified every six months indefinitely, as long as the individual needs treatment and would pose some form of risk if unsupervised.

CIVIL COMPETENCIES

Petition for Instruction: In Rhode Island, medication or other treatments cannot be forcibly administered to an individual, except in an emergency, without court approval at Mental Health Court. The standard for determining whether an individual can refuse treatment is whether he/she is competent to give informed consent. If the judge determines that the individual is incompetent to give informed consent and that the benefits of the medications outweigh the risks, the court substitutes its competent decision-making abilities for the incompetent individual and usually authorizes involuntary psychiatric medication. If the court determines that the individual is competent to make treatment decisions, then medications cannot be given absent an emergency.

Guardianship: In Rhode Island, guardianship proceedings occur in the community's probate court. Town/city councils appoint probate judges. Once a judge appoints a guardian, there is no automatic expiration but guardians must make annual reports to the probate court.

Guardianship authorizes a guardian to make decisions on behalf of his/her ward. Rhode Island's statute allows for limited guardianship, including guardianship of health care, financial matters, residence, "association" or "other."¹¹ The law requires the appointment of a *guardian ad litem*, a lawyer who visits the proposed ward during the proceedings to explain what is going on, to ask whether s/he wishes to attend the hearing, wants to contest the petition and/or wants to limit the guardian's powers. If the proposed ward wishes to contest any aspect of the guardianship and does not have a lawyer, the Probate Court must appoint one. A physician must complete a functional assessment tool, often with the assistance of a social service agency, to complete the application.

A guardian cannot sign a ward into a mental institution because involuntary psychiatric admissions occur only through civil commitment, discussed above. If a guardian is appointed to make medical decisions, a Petition for Instruction cannot be used for treatment refusal. CMHCs or other agencies providing services to a ward are not allowed to become guardians.

Testamentary capacity: Individuals must be of sound mind, or competent, to make a valid will. Courts typically look for four attributes. First, testators must know at the time of the making of their wills that they are making their wills. Second, testators must know the nature and extent of their property. Third, testators must know the "natural objects of [their] bounty." Fourth, testators must know the manner in which their wills will distribute their property.¹²

In Rhode Island, probate courts handle wills. Since wills are invalid if the testator is incompetent at the time of the writing of the will, the testator

may have his/her competency assessed by a psychiatrist at the writing of the will to avoid contestation after death.

DISABILITY AND TORTS

The civil court system provides monetary compensation to individuals injured by others. Tort law, the law of civil wrongs, includes an array of harms, including injury, disability, psychic harm, and malpractice. Tortious conduct can result from intentional conduct, negligent conduct, or when the actor's motivation is not at issue but for which strict liability is imposed. Because the tort system is fault-oriented, other systems of compensation have developed, such as **worker's compensation (WC)**. A psychiatrist may serve as an expert witness for the plaintiff or defendant in civil suits.¹³

Disability: Psychiatric disability claims commonly include **Temporary Disability Income (TDI)**, WC, social security, and private disability insurance.

TDI is a disability/sick leave benefit program for qualifying workers to partially replace lost wages. In psychiatric claims, the treating psychiatrist supports work disability for inpatient psychiatric hospitalizations, so this does not typically become a forensic issue.¹⁴

WC is a compulsory system in which both employers and employees give up some rights. Employers must insure employees for work-related injuries, and usually must waive the defenses available in tort. Employees cede the prospect of higher monetary awards available in a tort case, yet obtain more certain recovery based on a fixed formula derived from the pre-injury salary and the degree and duration of the disability. The disabled worker also receives payment for medical care and other services.¹⁵ In psychiatric claims, the treating psychiatrist may support a work-related disability, and an independent psychiatric examination may be requested to assess whether the disability is work-related.

The Social Security Administration provides two benefits. The **Supplemental**

Security Income Program (SSI) (Title XVI, 1972) provides minimal income for the needy aged, the disabled, and the blind. **The Social Security Disability Insurance (SSDI)** Program (Title II, 1956) covers disabled workers and their dependants who paid into the Social Security trust fund via the Federal Insurance Compensation Act tax on earnings. Unlike WC claims, causation is not at issue in social security claims. Eight diagnostic categories of mental disorders can cause a medically determinable impairment (e.g., psychotic disorders, mental retardation, personality disorders, substance addiction). A claimant must also have functional limitations in addition to meeting criteria for a mental disorder.¹⁶ In psychiatric claims, the treating psychiatrist may support a work-related disability. An independent psychiatrist examines the claimant and reports to the Social Security administration. In contested claims, a second independent examiner testifies at the Office of Hearing and Appeals.

Private disability insurance policies can either provide for psychiatric short-term or long-term disability, or can exclude mental/nervous claims entirely. There was a wave of increased disability claims in the 1990s among professionals, especially physicians, because of the subjective nature of disability claims (both psychiatric and non-psychiatric), particularly liberal insurance policies issued from 1985 to 1989, and the impact of managed care on work pressure, professional autonomy and income. The definition of disability depends on the policy. Psychiatrists conducting independent medical evaluations of disability claimants must know the policy definition to focus on the relevant standard.¹⁷ In these cases, it can be difficult for the treating psychiatrist to act as both treatment provider and forensic expert.

Torts: The general concepts that define an actionable wrong include whether the defendant owes a duty to the plaintiff, which the defendant violates, thereby causing proximate harm, which is compensable. The forensic evaluation of a mental injury claim can

be for the assessment of psychic harm, post-traumatic stress disorder, or for claims that mental health professionals and/or agencies failed to adhere to certain standards of care when treating a patient.¹⁸

CONCLUSION

It is not widely appreciated how the legal system needs psychiatry to help address criminal and civil disputes and to assess and treat persons with mental illness in correctional and forensic settings. In both the public and private sectors, the subspecialty of adult forensic psychiatry allows psychiatrists to improve patient care and to make substantive contributions to the law.

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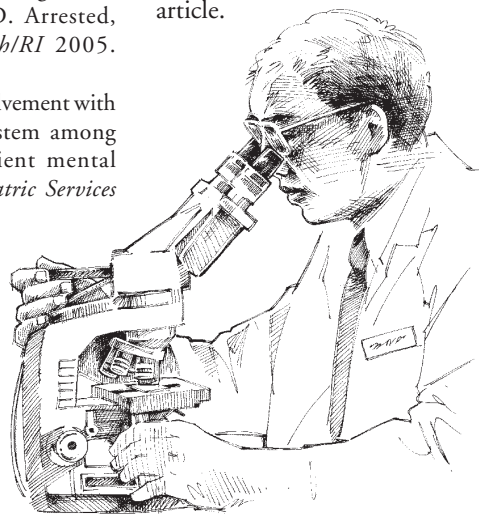
Barry W. Wall, MD, is Director, Forensic Service, Eleanor Slater Hospital, is in private clinical and forensic psychiatric practice and is Clinical Associate Professor, Department of Psychiatry and Human Behavior, Brown Medical School.

CORRESPONDENCE:

Barry W. Wall, MD
Previously cited.

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FORENSIC ODONTOLOGY AND THE POSTMORTEM IDENTIFICATION PROCESS

STEPHEN J. PUERINI, DMD

The term “forensic” is from the Latin, meaning forum or a place where legal matters are discussed. Forensic medicine and dentistry (odontology) deal with the professional handling, examination, interpretation and presentation of medical and dental evidence that come before legal authorities. Although the Miriam-Webster dictionary dates the term from 1659, a full text on the subject dates back to 6th century China. Forensic identification techniques go back even further. In 45 AD, the Roman Emperor Nero used dental impressions to identify slaves; this practice continued throughout Europe and the United States during the slave trade. In 1867, Oscar Amoedo, an Italian dentist, helped identify hundreds of victims of the Great Fire of Paris. Techniques and protocols developed during that fire are still in use today.

Forensic odontologic identification has grown in scope for two reasons. First, there are legal requirements for positive proof of identification to obtain a valid death certificate, regardless of circumstantial evidence. These legal requirements impact criminal conviction, the disposition of insurance cases, and the determination of liability. Second, the advent of DNA profiling and the refining of comparative technique have made forensic evidence more of a requirement for legal proceedings.

PRACTICAL APPLICATION

Forensic study was originally directed toward identification of the living as well as the dead. To that aim, it is important to note that teeth are extremely durable, able to survive millennia with little or no degradation. Variations in morphology can assist in determining geographic origins. Wear patterns are often indicate a person’s oral habits, occupation, and even dietary characteristics. The Presidential assassin John Wilkes Booth was identified with

dental records. Dr. Joseph Warren, an American Revolutionary patriot, was identified at Bull Run by means of a sterling silver partial denture fabricated by Paul Revere. Serial killer Ted Bundy, in the absence of any “smoking gun,” was convicted primarily on bitemark evidence left on his victims. Amidst controversy, dental records ultimately identified the remains of Adolph Hitler and Eva Braun.

Anthropometry, the branch of anthropology that uses comparative bony measurements to assist in determining racial origins, was the prevailing discipline used in the study of the skeleton in the late 19th and early 20th centuries. With the advent of x-ray technology, however, the field of forensic study broadened substantially. Forensic scientists began to use bony anomalies, fractures and prostheses to confirm identification, as well as to contribute information on sex, nationality, and even social standing and occupation.

Soon after Austrian physician Karl Landsteiner introduced blood typing in 1901, he and others employed this new discipline in the field of forensic study. Also in 1901, Sir Richard Henry, newly appointed head of Scotland Yard, forced the adoption of fingerprint identification to replace anthropometry as the prevailing identification technique. Advances in forensic study proceeded continuously, prompting a group of physicians, dentists and scientists in 1950 to form the **American Academy of Forensic Science (AAFS)**. This organization subsequently began publishing what has become one of the premier journals on the subject, the *Journal of Forensic Science*.

Progress in the fields of forensic medicine and dentistry expanded in 1984, when Sir Alec Jeffreys developed the first DNA profiling test. In 1986 he used his test in the successful prosecution of Colin Pitchfork, who

was suspected and ultimately convicted of murdering two girls. Interestingly, in the course of the investigation this same test was first used to exonerate an innocent suspect. In 1987, DNA profiling was used successfully in the United States during the trial of a sexual predator in Orlando, Florida. Later that year, similar evidence was challenged in the case of *New York vs. Castro*. The result of this scrutiny “culminated in a call for certification, accreditation, standardization, and quality control guidelines for both DNA laboratories and the general forensic community.” Today, DNA is becoming the “gold standard” in the area of forensic identification and criminalistics.

THE POSTMORTEM IDENTIFICATION PROCESS: THE STATION NIGHT CLUB FIRE

On February 20, 2003, in The Station fire disaster, 100 people lost their lives, making it the fourth most deadly club fire in the nation’s history and the worst fire in the history of the state. Forensic odontology was a major part of the postmortem identification process.

The forensic process began at the scene, as it usually does. Survivors were extricated and transferred to local and regional hospitals. While victims normally would be extensively photographed on site, this was not practical or appropriate because many bodies, victims as well as injured, were stacked in doorways and near exits. The first priority, therefore, was to locate survivors, some trapped below the dead. Victims were then assigned a numerical identification and transported to the state morgue. Since the physical plant at the **Office of the State Medical Examiner (OSME)** was not adequate to handle the volume of victims, refrigeration trailers were brought to the state facility.

OSME staff was supplemented due to the workload. In a matter hours, a

team of more than thirty-five personnel, most of them volunteers, was assembled. This included physicians, dentists, a Federal **DMORT (Disaster Mortuary Operational Response Team)**, as well as support and clerical staff. Personnel operated in 12-hour shifts, 24 hours a day. Five-person autopsy teams were formed on site; each team included a physician/medical examiner, a dentist, a property monitor, a scribe/examiner assistant, and a mortician.

Team assembly, protocol establishment and setup of the arena occurred the day after the fire. All available personnel began contacting dentists and volunteers obtained data from the victims' families at another location. All victims would require a full autopsy as mandated by law. The emphasis was on completeness since the logistics of retrieving a body after autopsy would be counterproductive.

The identification process included visual identification (for approximately 15 victims), personal identification (driver's licenses, etc.), jewelry, orthopedic and surgical procedures or prostheses, tattoos and other distinguishing marks, fingerprints, blood type, DNA, auto key fobs (with traceable FCC license numbers), pharmacy and grocery "swipe" cards, cell phones, pagers, clothing, general physical characteristics, and, of course, dental records. Every effort was made to corroborate all identifications with as many supplemental criteria as practical. Ultimately, the vast majority of the IDs were accomplished using ante-mortem dental records. One victim, who had no known dental record, was identified using DNA profiling.

By Saturday morning nearly 80% of the original ante-mortem dental records were on site, some from as far as California and Canada via courier or e-mail. State police from four neighboring jurisdictions hand-delivered records obtained from area dentists, most of whom were not in their offices but home for the weekend. Interestingly there was a surplus of records when the process was complete. These records were the result of misreporting, fraudulent reporting, and, in one case, associated with an

unidentified survivor hospitalized in Boston. To preserve the integrity and security of each of the records a strict protocol dictated how and by whom the records would be handled. Despite the constant transfer and manipulation of charts, notes and radiographs, not one piece of information was lost or misplaced.

By Monday afternoon, nearly all victims had been identified. The process was complete by Tuesday, nearly three days earlier than anticipated. At the end, individuals trained to recognize the symptoms of acute stress disorder interviewed all team members. Counseling was available to those potentially subject to its effects.

Following the fire, the Titan Corp., a homeland security consultant, compiled an after action report on the performance of the OSME and other state and local personnel. While critical of the effectiveness of the initial response of the OSME, the report recognized the agency for performing over 96 autopsies and identifications in fewer than five days. The report stated, "This phenomenal accomplishment required the complete commitment of the OSME staff, Federal DMORT, and scores of volunteers, including funeral directors, dentists and administrative personnel" (Titan Report, Annex E – Part IV, Page E-72).

FORENSIC PRACTICE

It would seem, at first glance, that forensic discipline might have little place in the average private practice of medicine and dentistry. However, the example of the Station fire proves otherwise. Healthcare professionals, whether functioning as volunteers or cooperating with authorities to provide records, were integral to the process of identifying the dead.

In many ways, as health professionals, we are all forensic specialists. Each time we examine, interview a patient, pore through data, study history and evaluate test results, we are implementing the forensic process. This information and its byproducts constitute the patient record. It is this record that may, at any time, be required for presentation in a

legal forum. It may be required for the purpose of identification, as in the case of the Station disaster. It may provide the only defense in a malpractice proceeding or it may be the first key to a diagnostic puzzle. Its value and necessity cannot be underestimated. We, as practitioners, are charged with the responsibility of maintaining its accuracy and completeness. The growing sophistication of forensic technique will likely continue to "raise the bar" in this regard, increasing the expectation for comprehensive accuracy. The time may not be far off when we will include a DNA profile as a standard component in a patient record.

CONCLUSION

Forensic medicine and dentistry have received increasing media attention as techniques and methods have grown more sophisticated. The fascination of the public for both factual and fictional accounts of forensic pursuits has fed this trend. While this may seem trivial, there are beneficial consequences. The availability of new technologies can only make us better at what we do, how we do it and hopefully how we record it.

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Available upon request.

Stephen J. Puerini, DMD, is in general dentistry practice. He has been a forensic dental examiner for the State of Rhode Island for 28 years and is a member of the Northeast Regional Board of Dental Examiners.

CORRESPONDENCE:

Stephen J. Puerini, DMD
115 Budlong Road
Cranston, RI 02920
Phone: (401) 944-8100
Fax: (401) 946-1060
e-Mail: docsjp@cox.net

CHILD AND ADOLESCENT FORENSIC PSYCHIATRY IN RHODE ISLAND

JOSEPH V. PENN, MD, CCHP

Child and adolescent forensic psychiatry, a relatively new subspecialty,¹ evolved out of a need to better evaluate the legal rights of youths in relation to their unique developmental and psychological needs. While adult forensic evaluators generally provide data for the courts without any duty of care toward the person evaluated, child psychiatrists address “the best interests” of the youth. The child forensic expert’s duty is that of the truthful reporting of findings to the court to aid in the court’s deliberations.²

Due to a paucity of forensic psychiatry fellowship-trained child psychiatrists in Rhode Island, many child forensic evaluations are performed by child or adult psychiatrists, psychologists, and other mental health professionals (e.g., social workers, nurses). The extent to which the forensic child psychiatrist of the future will be a child psychiatrist with an interest in forensics, or a psychiatrist who has completed residency training in general, child psychiatry, and forensic psychiatry remains unclear.¹

EVALUATION PROCESS

The forensic psychiatric evaluation of a minor differs from a traditional clinical psychiatric evaluation for treatment purposes.²⁻⁴ The child forensic evaluation aims (1) to identify the reasons and factors leading to the referral, (2) to obtain an accurate diagnostic picture of the youth’s developmental functioning and the nature and extent of the youth’s behavioral difficulties, functional impairment, and/or subjective distress, and (3) to identify potential individual, family, school, peer, or other factors that may account for problems resulting in legal involvement or claimed impairment or distress.

In the first contact with the retaining agency (private attorney, RI **Department of Children, Youth, and Families (DCYF)** or the RI Family Court), the child psychiatrist

must identify potential role conflicts, boundaries and expectations of the consulting relationship to ensure that s/he will complete an objective and comprehensive evaluation. The forensic services may include record review only, examination of youth, preparation of a written report, and/or deposition or court testimony. A forensic evaluation may involve critiquing previous work conducted by another mental health professional or by a child protective services investigator.

The child forensic evaluator and the youth evaluatee do not develop a traditional doctor-patient relationship. The evaluator acts as a fiduciary to the court or retaining agency (law firm, school department), and unlike the treating psychiatrist, holds no fiduciary duty to the patient. (Table 1)

The child forensic evaluator must follow certain principles to perform an evaluation that will meet the legal standard of *within reasonable medical/psychiatry certainty*. The appearance of bias, lack of neutrality or objectivity, prior involvement with any of the parties, and/or the failure to perform a competent evaluation can be problematic. It is rarely appropriate for a child psychiatrist to act as a forensic expert and treatment provider for the same youth or family.^{2,3,5}

At the outset of the interview, the evaluator should review with the youth: the purpose and process (solo evaluator versus team interview) of the evaluation, the evaluator’s agency, whether the evaluation is being videotaped, what will happen to the information obtained, and that the evaluation is not for treatment. Although not legally required, it is advisable to attempt to obtain a youth’s assent to the interview, and whenever possible, to offer the same explanation to the parent or legal guardian.³

Focusing on the forensic question (e.g., whether the juvenile is competent to stand trial) and providing information in a manner that helps the referral/

retaining source requires a systematic approach. Forensic evaluators review all available records and when indicated, additional records from collateral sources, and perform serial interviews of the youth. Practice parameters specify components of specialized forensic evaluations (e.g., child custody, youth who may have been sexually or physically abused).⁶⁻⁷ The following sections provide examples of different types of forensic evaluations.

CHILD ABUSE AND NEGLECT EVALUATIONS

The legal system often turns to pediatricians, specialty clinics (e.g., Hasbro Hospital Child Safe Program, Child Advocacy Center), psychiatrists, child abuse specialists, and other professionals to identify whether a youth is a victim of abuse (e.g., physical abuse, sexual abuse, emotional abuse, medical abuse such as Munchausen’s syndrome by proxy, and/or neglect) and what interventions are needed. Additionally, a forensic evaluation may be used in civil litigation, where the youth as plaintiff seeks compensation for damages related to the alleged abuse.

The child psychiatrist’s role in these cases depends on the boundaries established during the initial contact with the hiring authority. In criminal cases, the prosecuting attorney, defense attorney, or the court itself may retain the psychiatrist. In civil cases, the guardian *ad litem* (a person, often an attorney, appointed by the court to represent the “best interests of the child”), private attorney, law enforcement investigators, child protective services, or the court may request the evaluation.³ The evaluator should consider the clinical presentation of abused children, normative sexual behavior of children, various interview techniques, the possibility of false statements, and other important forensic issues during the evaluation.

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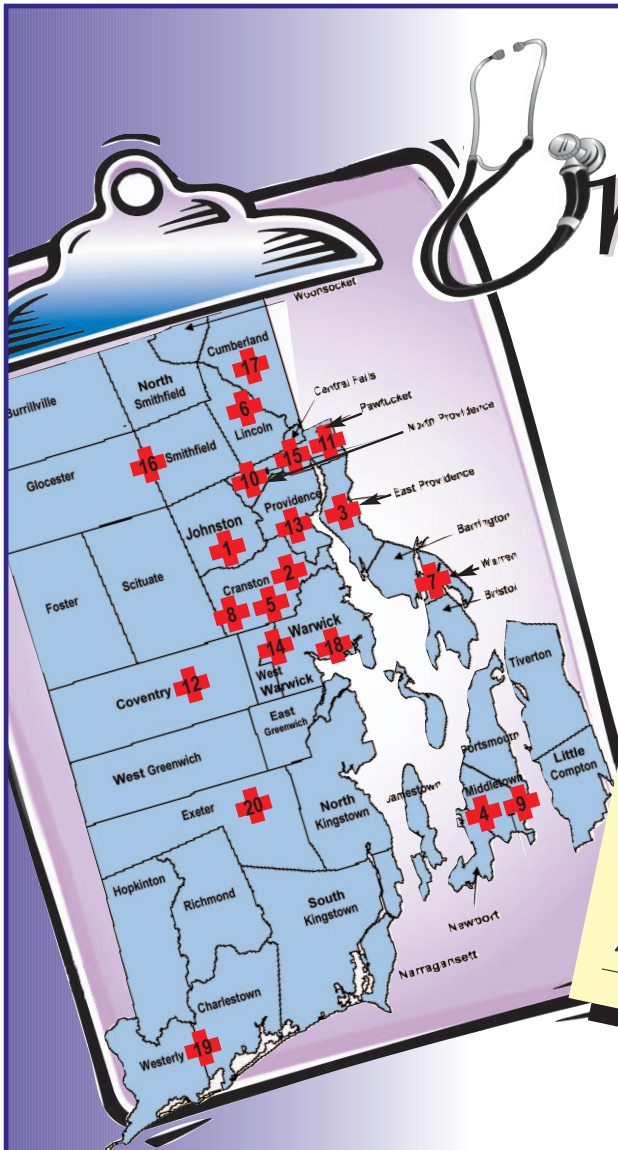
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AUTHORIZED SIGNATURE

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Dr. Daniel Regan
ph: 273-9400 Fax: 273-2339

2. Cranston Medical
495 Atwood Ave., Cranston, RI 02910
Dr. David Carpentier
ph: 943-4540 Fax: 944-7727

3. East Providence Medical Center
525 Taunton Ave., East Providence, RI 02914
Dr. Joseph Alessi
ph: 438-3170 Fax: 438-3240

4. Family Medi Center
700 Aquidneck Avenue, Middletown, RI 02842
Dr. Richard Morgera
ph: 847-0519 fax: 846-0283

5. Garden City Treatment Center
1150 Reservoir Ave., Cranston, RI 02920
Dr. Adib Mechrefe
ph: 946-2400 Fax: 946-5862

6. Lincoln Urgent Care
2 Wake Robin Rd., Lincoln, RI 02865
Dr. John Solomon
ph: 333-9595 fax: 334-3331

7. Metacom Medical Center
639 Metacom Ave., Warren, RI 02885
Dr. Joseph Zibrida
ph: 245-1500 Fax: 247-2618

8. Midland Medical
1312 Oaklawn Avenue, Cranston, RI 02920
Dr. Stephen Beaupre
ph: 463-3380 fax: 463-3308

9. Newport County Treatment Center
67 Valley Road, Middletown, RI 02840
Dr. Robert Gordon
ph: 847-4950 Fax: 847-5767

10. North Providence Medical Services
1637 Mineral Spring Ave., No. Providence, RI 02904
Dr. Stephen D'Amato
ph: 353-1012 Fax: 353-6362

11. Pawtucket Healthcare
209 Armistice Blvd., Pawtucket, RI 02861
Dr. Karl Felber
ph: 725-4100 fax: 725-5010

12. Pawtucket Valley Medical
982 Tiogue Ave., Coventry, RI 02816
Dr. Daniel Collins
ph: 821-6800 fax: 823-9203

13. Providence Medical Healthcare
80 Dean St. Providence, RI 02903
Dr. William Palumbo
ph: 521-3270 fax: 521-6532

14. Stat Care - Warwick Medical Bldg.
400 Bald Hill Road, Suite 511, Warwick, RI 02886
Dr. Daniel Halpren-Ruder
ph: 737-4420 fax: 737-9934

15. Urgent Care of Pawtucket
100 Smithfield Ave., Pawtucket, RI 02860
Dr. Frank D'Alessandro
ph: 725-8600 fax: 725-8064

16. Urgent Medical Care
400 East Putnam Pike, Smithfield, RI 02828
Dr. Daniel Halpren-Ruder, MD
ph: 232-7001 fax: 232-7388

17. Urgent Medical Care
2140 Mendon Road, Cumberland, RI 02864
Dr. Daniel Halpren-Ruder
ph: 475-3000 fax: 475-3204

18. Warwick Medical Walk In
1131 Warwick Ave., Warwick, RI 02888
Dr. Robert Gordon
ph: 785-9333 fax: 785-9433

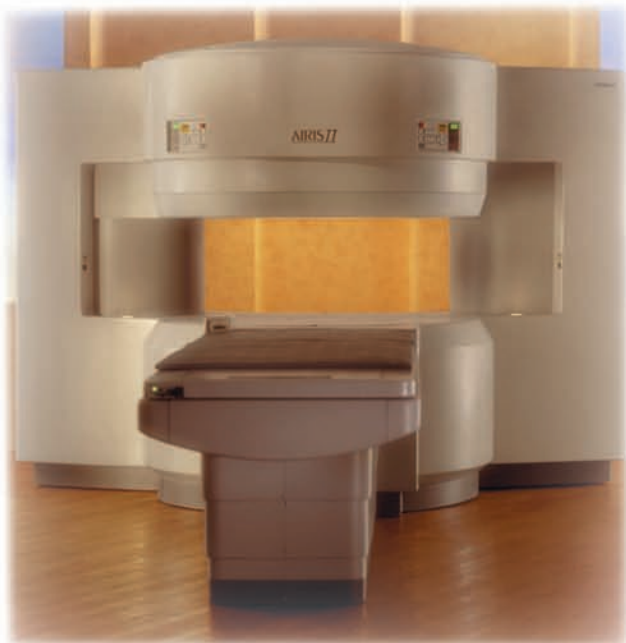
19. Westerly Urgent Care
77 Franklin St., Westerly, RI 02891
Dr. Rocco Andreozzi
ph: 596-6464 fax: 348-8660

20. Wood River Health Services
823 Main St., Hope Valley, RI 02832
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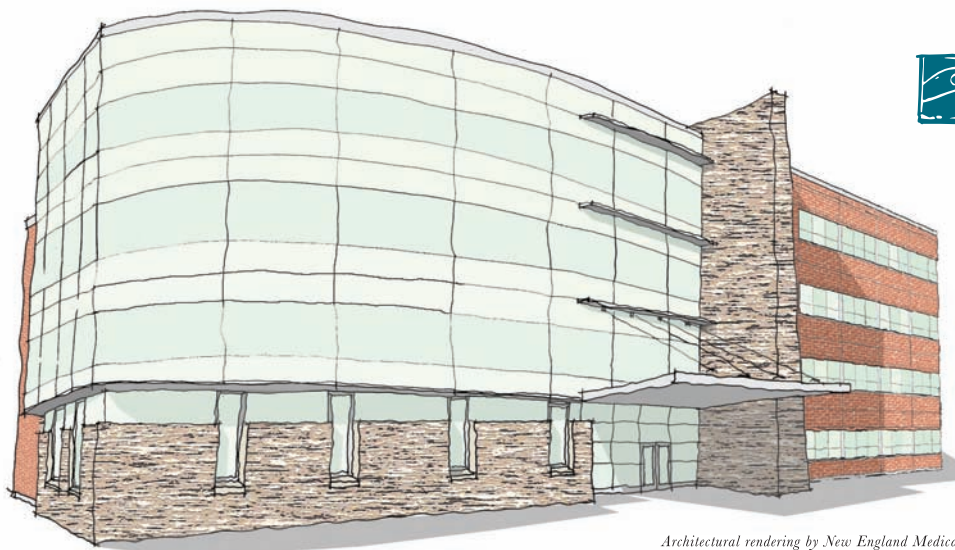


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Table 1. Differences Between Clinical and Forensic Evaluations

	Traditional diagnostic "clinical evaluation"	Forensic evaluation
Purpose	Relieve suffering	Answer a legal question
Relationship	Doctor-patient	Evaluee-evaluator
Client	The patient	The court or retaining agency
Agency	Fiduciary duty to the patient/ Duty to the patient's best interests Patient's welfare first	Fiduciary duty to retaining source (e.g., attorney, court)
Objective	Help heal the patient	By report or testimony: inform and teach the fact-finder (e.g., judge, jury) or retaining agency
Confidentiality	Essential	Lack of confidentiality
Process	Establish diagnosis and treatment plan	Conduct objective evaluation, diagnosis may be nonessential
Treatment	Treatment rendered	no treatment rendered
Sources of information	Self report, on occasion some collateral records	Exhaustive attempt including serial interviews, interviews of additional historians, review of collateral data
Bias	Therapeutic bias exists: desire for patient to get better, serve as patient advocate	Attempt to be neutral and objective, lack of bias; No investment in outcome
End product	Establish a therapeutic relationship	Answer the referral question either in the form of a verbal or written report to retaining source, deposition, and or testimony

questions child psychiatrists regarding whether to pursue termination of parental rights or reunify a youth with a parent or guardian who has perpetrated past abuse, or who has mental illness, substance abuse, legal problems, or other impairments in their care-taking abilities. The evaluator will provide recommendations on the reunification process, such as a timeframe, frequency and type of visitation (e.g., supervised, unsupervised, overnight), and other interventions. When a parent or guardian demonstrates a pattern of problematic behaviors, a child psychiatrist may be asked to provide a diagnostic evaluation with treatment recommendations or alternatively, a more detailed fitness-to-parent evaluation. The child forensic evaluator may also consult in foster care, adoption, and other reunification cases.

**CIVIL EVALUATIONS
CHILD CUSTODY AND
VISITATION DISPUTES**

There is no accepted single standard procedure for conducting custody and visitation evaluations. When contacted initially by a parent, a potential forensic evaluator should explain the basis for accepting the case, avoid discussing details of the case with that parent, and ask to speak with the parent's attorney. When performing a child custody evaluation, the evaluation usually consists of psychiatric or psychological assessments of the child and both parents, with conclusions and recommendations to the legal standard of what is in *the best interests of the child*.

In a custody evaluation, it is usually best to have access to all family members, collateral information and records. Cases should be accepted only if the court has appointed the evaluator,

or if both parties agree on the evaluator. The child psychiatrist should conduct the evaluation as an impartial advocate. The evaluator may also consult to one party to review documents, or to critique the evaluation of the opposing or court's expert. If the evaluator has seen only one parent, opinions should not be given on custody or on the parent not seen.⁶

**POSTTRAUMATIC STRESS
DISORDER (PTSD) AND
PSYCHIC INJURY**

A child psychiatrist may be called as expert for a plaintiff or defendant in a civil suit in which emotional damages following a traumatic incident have resulted in a claim of psychic harm and/or PTSD. In a personal injury case, the expert should know that for liability to exist, there must have been a dereliction of duty (owed to the plaintiff) committed by the defendant. As a direct consequence, the plaintiff also must have sustained damage. The psychiatric expert's task is to determine whether the plaintiff suffered mental harm or psychic injury/damage, and, if so, whether it was as a direct result of an action or failure to act by the plaintiff. In addition to being familiar with child development and the diagnosis of PTSD, the evaluator needs to know how: 1) PTSD presents at various ages, 2) to reach a final diagnosis, 3) address symptom severity and level of impairment, and 4) issues of causation, prognosis and treatment recommendations. The evaluator should also assess a child's ability to provide an accurate history and testimony, utilize psychological testing when indicated, distinguish between pre-existing, co-morbid conditions and post-event conditions, and assess issues of malingering, secondary gain, and disability.

**MALPRACTICE AND OTHER
TORT CASES**

Child psychiatrists may assist in civil litigation stemming from an alleged injury (tort) as consultant to the plaintiff or defendant. When a youth engages in behavior that harms self or others, some plaintiffs may allege that

the clinician or agency failed to conduct a competent evaluation of a youth, render appropriate treatment services, or carry out their duty to protect the youth or warn potential victims.

Similarly, claims may be brought against clinicians and administrators of hospitals, residential programs, group homes, or other treatment programs, for alleged failure to adequately supervise youth who, while housed in these settings, were neglected, physically or sexually abused by other youth, staff, or care-providers, or alternatively are assaultive to staff or other peers. Other claims may include allegations of youth or staff injury during seclusion or restraint, excessive psychotropic medication use, coercive practices, or other injuries or sequelae.

Plaintiffs may also allege that a clinician failed to provide adequate informed consent of a psychotropic medication's potential risks, benefits and alternatives. Other claims may include that a practitioner deviated from the standard of care with regard to prescribing, dosing, monitoring and re-evaluating the youth.

The amount and frequency of psychotropic medication use, and, in particular, the use of multiple psychotropic medications, has increased in juveniles. Additionally, the FDA recently issued black-box warnings of a possible association between SSRI agents and increased risk of juvenile suicide. The impact on claims against clinicians, and on prescribing practices, is unclear.

A child psychiatrist may also help the retaining agency avoid litigation in a risk management or preventative role. Consultation may include the review and development of policy or procedures; e.g., the use of physical/mechanical restraints, the use of PRN medications for severe behavioral dyscontrol, and staff training regarding suicide prevention and violence risk assessment.

CRIMINAL EVALUATIONS

CONSULTING TO THE FAMILY COURT

The RI Family Court deals

with a high volume of cases of increasingly complicated youths and families with co-morbid medical, psychiatric, and substance use disorders and family, legal, community, and psychosocial adversities. All of this comes at a time of fewer community resources, diversionary services, and other alternatives to confinement. Additionally, the Court and the RI DCYF face a shortage of programs and shrinking resources to support court-ordered placements and treatment programs. The RI Family Court recently developed truancy court, drug court, and other diversionary programs to divert first-time and non-violent juvenile offenders in a timely manner.

Although nationally there is much attention to rare but high-profile events such as school shootings, in Rhode Island most juveniles requiring mental health evaluation and services come to the Family Court through waywardness/disobedient petitions, school truancy, neglect and abuse petitions, in addition to other violent and non-violent offenses. Attempts are made to refer these juveniles for timely diagnostic evaluations by child mental health professionals. The immediate goals are to identify the most appropriate evaluation and treatment services (e.g., mental health, substance abuse, sexually offending) in the least restrictive manner. Longer-term goals are to avoid a progression into more serious, repeated, and violent offenses, substance abuse/dependence, out of home placements, injury to victims, death/injury by violent means, or a series of legal interactions and incarcerations in the juvenile justice and adult correctional systems.

The child evaluator may provide recommendations to the RI Family Court, RI DCYF, or juvenile probation. The court then initiates referrals for mental health and/or substance abuse treatment, outreach and tracking, life-skills training, educational interventions, parenting education, relapse prevention, and other interventions. Based on the evaluator's recommendations, the Court might order placement into a group home, foster care, or residential treatment.

JUVENILE CORRECTIONS

The Rhode Island Training School (RITS), Cranston, Rhode Island, the state's sole juvenile correctional facility, admits approximately 1100 youth per year, and is run by the RI DCYF. All youth are sent to the facility either as detained or sentenced/adjudicated youth for various violent and non-violent offenses under order of the RI Family Court. In 1999, Rhode Island/Hasbro Hospitals/Lifespan entered into an agreement with the RITS and RI DCYF to provide psychiatric, pediatric, and dental services to RITS juveniles.

Aside from improving the caliber of clinical services, this collaboration has resulted in additional residency training, medical student, and other professional training opportunities. In this setting, a child psychiatrist would evaluate clinically or court-referred youths, recommend further evaluation or treatment interventions, and assess youth presenting with suicidal ideation or attempts. Due to a high incidence of suicidal behavior in juvenile correctional facilities, this is a particularly daunting task.⁸ The child psychiatrist also consults with other staff regarding the treatment of youth with psychiatric and behavioral issues, and assists with staff education, training, and other administrative tasks.⁹

OTHER SPECIALIZED ASSESSMENTS

A child psychiatrist may be asked to evaluate a youth to assist the court at different stages of juvenile delinquency proceedings. They may be asked to render an opinion about the youth's capacities to waive Miranda rights or their competency to stand trial.⁴ Juvenile defendants are presumed competent to stand trial unless there is some behavior or awareness of a history of mental disorder or other deficiency that may interfere with the youth's ability to appreciate the legal proceedings against them or to assist in their defense.

Juveniles who have engaged in fire-setting, sexual offending, or threatening behaviors may be referred for more specialized risk assessments of future

dangerousness. The evaluator is asked to provide a professional judgment that a youth will or will not engage in an aggressive act in the future, and what circumstances or parameters will increase or reduce this risk for violence. Another type of evaluation is assisting the court with waiver proceedings in Family Court to determine whether the court should waive jurisdiction and thereby transfer the youth to adult criminal court for trial.

A child psychiatrist may also be asked to perform other types of traditionally adult forensic evaluations such as criminal responsibility - whether the defendant was not guilty by reason of insanity at the time of the offense. Another evaluation is a diminished capacity defense - an affirmative defense based on the defendant's mental state at the time of the crime that results in criminal conviction, but with mitigation of the sentence. Finally, a child psychiatrist may be asked to identify mitigating factors (e.g., due to a youth's developmental stage or childhood factors) that may result in a reduced or less punitive sentence.

CONSULTATION TO OTHER ENTITIES

A child psychiatrist may serve in multiple other forensic consultative roles.

School departments may request a violence risk assessment of youths who demonstrate violent behaviors, writings, drawings, or other communications. Similarly, some inpatient psychiatric providers might seek guidance regarding the optimal placement, level of supervision and services upon release.

School departments might request forensic consultation when a student or family requests specialized accommodations or resources due to mental health issues or when a family threatens or pursues litigation. Other potential areas of referral may include alleged sexual harassment, stalking, predatory, and inappropriate sexualized behaviors in school settings.

A child psychiatrist might be asked to provide independent evaluations of youths who are applying for Social

Security Disability benefits. The office of **Disability Determination Services (DDS)** gathers the needed information typically from schools, primary care providers, and parents, and then makes a medical decision regarding childhood disability claims. They may request an **independent medical examination (IME)** from a child psychiatrist or other specialist. Additionally, when a claim is denied, the family may file an appeal, and during the appeals process, an additional IME evaluation may be requested.

CONCLUSION

Child and adolescent forensic psychiatry encompasses diverse medical, developmental, psychosocial, and legal issues. The goal of the child forensic evaluator is to strive for objectivity, neutrality, and timely completion of evaluations and to provide effective consultation to the courts, attorneys, and other agencies. The extent to which child and adolescent forensic psychiatry will develop into a formal subspecialty with requisite training, continuing medical education requirements, and demonstration of particular expertise for more specialized types of forensic evaluations remains unclear.

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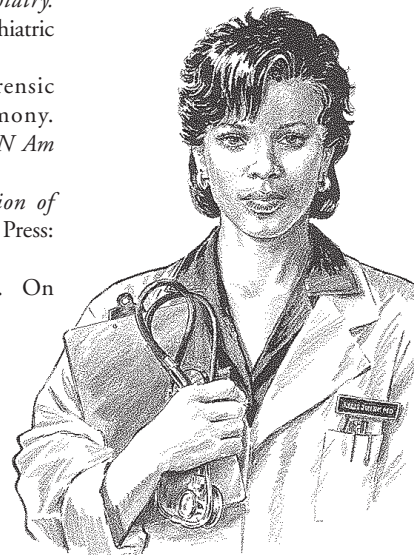
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Joseph V. Penn, MD, CCHP is Director, Child and Adolescent Forensic Psychiatry, Rhode Island Hospital; Director of Psychiatric Services, Rhode Island Training School; and Clinical Assistant Professor, Department of Psychiatry and Human Behavior, Brown Medical School.

CORRESPONDENCE:

Joseph V. Penn, MD, CCHP
Rhode Island Hospital
Child and Family Psychiatry
593 Eddy Street
Providence, Rhode Island 02903
Telephone: (401) 462-7232
Fax: (401) 462-0211
e-Mail: Jpenn@lifespan.org



FORENSIC PEDIATRICS

CHRISTINE E. BARRON, MD, AND CAROLE JENNY, MD, MBA

The subspecialty of forensic pediatrics focuses on the evaluation, treatment and prevention of child abuse and neglect. National statistics reveal that an estimated 3 million reports of suspected child maltreatment are made to child welfare agencies annually, and nearly 1 million children are found to be victims of at least one form of maltreatment. The US Department of Health and Human Services reports the rate of child victimization was 12.4 victims per 1,000 children in 2003. Neglect accounted for 60.9% of cases, physical abuse 18.9%, sexual abuse 9.9%, psychological abuse 4.9%, and medical neglect 2.3%.¹ A child may suffer from more than one form of child maltreatment.

THE SCOPE OF CHILD MALTREATMENT

An estimated 1,500 child maltreatment fatalities occur yearly, equivalent to 4 children dying each day as a result of child abuse or neglect. The majority of these fatalities occur in children younger than 4 years-of-age. The National Research Council summarized the consequences of child maltreatment in their 1993 report, *Understanding Child Abuse and Neglect*:

The consequences of maltreatment can be devastating. For over 30 years, clinicians have described the effects of child abuse and neglect on the physical, psychological, cognitive and behavioral development of children. Physical consequences range from minor injuries to severe brain damage and even death. Psychological consequences range from chronic low self-esteem to severe dissociative states. The cognitive effects of abuse range from attentional problems and learning disorders to severe organic brain syndromes. Behaviorally, the consequences of abuse range from poor peer relations all the way to extraordinarily violent behaviors. Thus, the consequences of abuse and neglect affect the victims

themselves and the society in which they live.²

In 2004 there were 2,906 children identified as victims of one or more forms of child maltreatment in Rhode Island.³ The Rhode Island Kids Count reports the rate of child victimization was 7.0 victims per 1,000 children in Rhode Island in 2004. Neglect accounted for 71% of cases, physical abuse 17%, sexual abuse 5%, psychological abuse 1%, and medical neglect 2%.⁴ The cause of the discrepancy between national and Rhode Island data is

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unknown. However, during the last five years the Rhode Island Department of Children, Youth and Families has redefined criteria for identifying abuse and neglect from “credible evidence” to a “preponderance of the evidence” standard, which may influence the Rhode Island data. The **Child Protection Program (CPP)**, described below, has completed evaluations for the diagnosis and treatment of suspected child maltreatment from every county within Rhode Island, because child maltreatment is experienced across all racial, ethnic and socioeconomic lines.

THE DEVELOPMENT OF THE SUBSPECIALTY OF FORENSIC PEDIATRICS

In 1962, C. Henry Kempe and colleagues defined the “battered child

syndrome,” which led to the engagement of pediatrics in a wide range of clinical research about the spectrum of abusive injuries to children.

The knowledge and research in this field has exploded in quantity and sophistication. In 1966, the National Library of Medicine began to offer the Medline medical information system. That year, Medline listed one article under the heading ‘child abuse.’ By 1996, 662 articles were published in indexed medical and psychiatric journals. Recent simple inquiries through PubMed resulted in over 16,000 hits for the term ‘child abuse.’

In a survey of 167 pediatric residency programs, Dubowitz found that the median amount of training in each year of residency in the area of child maltreatment was only seven to eight hours. Half of this time was spent in clinical supervision in the care of the maltreated child.⁸ In a similar survey of 147 pediatric training programs, 70% of faculty and 63% of residents thought that the time spent in training pediatricians about child sexual abuse was inadequate, and 74% of third year residents estimated that they had evaluated five or fewer patients for suspected sexual abuse during their residency.⁹

Practicing physicians are not always equipped to complete forensic evaluations for suspected child maltreatment. Although few studies document the knowledge of practicing physicians regarding child abuse, two surveys, in 1986 and 1996, illustrate the lack of knowledge among physicians in regards to examinations for suspected sexual abuse. In the 1986 survey, Ladson and colleagues found that many pediatricians and family practitioners incorrectly identified genital structures of the pre-pubertal female; 40.9% could not identify the hymen on a photograph of a normal child’s genital area. When this study was repeated in 1996, the incorrect responses remained at 38.7%, no statistical improvement

over the 1986 survey.¹⁰

Thus, the ever-expanding body of knowledge required to be a forensic pediatrician is beyond the scope of education offered in a general pediatric residency and typically exceeds the scope of practice of the general pediatrician. Since the establishment of this subspecialty, forensic pediatricians also have developed expertise in sexual abuse, neglect and factitious illness by proxy.^{5,6}

Today's forensic pediatricians diagnose abuse, consult with community agencies on child safety, provide expert testimony in courts of law, treat consequences of abuse and neglect, direct child maltreatment prevention programs, and participate on multidisciplinary teams investigating and managing child abuse cases.⁷ Forensic pediatrics must have expertise and knowledge in general pediatrics as well as unique medical knowledge in child development, nutrition, biomechanics of injuries, dynamics of abusive families, dermatology, pediatric trauma, orthopedics, genetic/metabolic disorders, gynecology, and forensic pathology. In addition, they must understand court procedures and expert witness testimony. They require specialized clinical skills, including the collection of forensic evidence, and forensic interviewing. They must be able to recognize a spectrum of rare and common diseases that may mimic child maltreatment.

Specialized training beyond a general pediatric residency is essential for clinicians to acquire that knowledge and clinical skills. There are a handful of Forensic Pediatric Fellowships available across the country. The Fellowship Program in Forensic Pediatrics at Hasbro Children's Hospital and Brown Medical School is recognized as one of the leading fellowship programs in the country.

DESCRIPTION OF THE FELLOWSHIP PROGRAM IN FORENSIC PEDIATRICS AT BROWN UNIVERSITY

The Fellowship Program in Forensic Pediatrics is provided through the CPP at Hasbro Children's Hospital.

Established in 1996, the CPP is a comprehensive hospital-based program that resolves child abuse identification and child protection issues. It is dedicated to the identification, prevention and treatment of children victimized by child maltreatment. The program has an extensive network of educational programs and clinical services, including the accurate and timely diagnosis and treatment of child victims throughout Rhode Island and neighboring states. In addition, the specialized training and resources within this program are used to clarify misinterpretations of medical findings that could lead to wrongful accusations of child abuse.

The CPP provides special forensic training to a pediatrician in all aspects of diagnosing and treating child maltreatment. The program actively recruits qualified applicants to complete a two-year academic program of subspecialty training in forensic pediatrics. The fellowship includes the following 5 components:

1) Clinical Component. Clinical training allows fellows to become proficient in the evaluation, care and treatment of child victims of abuse and neglect. The fellows acquire expert clinical skills and knowledge in the field of child abuse and neglect. This ongoing clinical exposure emphasizes the medical aspect of child abuse evaluations, including biomechanics of physical injuries; sexual abuse and sexual assault, including forensic evidence collection, diagnostic methods for sexually transmitted disease (STDs); the epidemiology and forensic significance of STDs; pediatric and adolescent gynecology; failure to thrive; neglect; medical abuse; and the differential diagnosis of conditions that may mimic child maltreatment. Collaboration with other subspecialties broadens the fellows' skills and insights.

An important component is the acquisition of skills for special procedures, including colposcopic documentation of genital injuries, photodocumentation of physical injuries, punch biopsies for genetic diseases, removal of vaginal foreign bodies, and collection and maintenance

of forensic evidence. Fellows also learn about the psychosocial aspects of child abuse and family violence. In addition, fellows learn about the dynamics of abusive families and the immediate and long-term consequences for victims and their families.

2) Teaching Component. Forensic Pediatric Fellows develop competency in lecturing to and teaching a variety of professionals, including non-medical personnel. This includes education and training of residents in pediatrics, family practice, emergency medicine, and psychiatry. The CPP fellows ensure that residents training in these specialties acquire the knowledge and skills to complete an initial evaluation for cases of suspected maltreatment.

3) Community Component. Fellows develop the ability to work as an integral part of a multidisciplinary team. They participate in community prevention programs and community outreach activities. Successful child abuse prevention and child protection require the involvement and collaboration of many different systems including child welfare, criminal justice, community-based support, and medical care. Thus, the program offers opportunities for fellows to provide leadership roles within the community.

4) Legal Component. Fellows learn how to provide medical expert witness testimony at court. They learn to create medical work products pertaining to the diagnosis and treatment of child maltreatment that withstand the rigors of the legal process. Fellows receive training in the evaluation of child pornography cases, and work with local, state and federal law enforcement agencies. Fellows participate in didactic lectures provided by local and regional attorneys and law professors. They develop expertise in understanding mandatory reporting laws and other laws, procedures and protocols used to protect the safety and rights of children and families. They obtain knowledge of court procedures in civil and criminal cases. In addition, fellows learn about public policy and legislative advocacy.

5) Research Component. Graduates of the fellowship program

take an active role in generating new knowledge through research. During fellowship, they acquire knowledge and skills for critical reading and scholarly writing. They complete clinical or epidemiological research, and are encouraged to publish their work in peer-reviewed journals.

Since the inception of the fellowship program at Brown Medical School, ten pediatricians have completed training and have accepted academic and clinical positions across the country. Those graduates provide teaching and training to improve the diagnosis, treatment and management of child maltreatment in academic medical centers and other practice settings.

CONCLUSION

At present, the number of pediatricians specializing in forensic pediatrics is inadequate to meet the demands for clinical services, teaching and research. Seventeen university-affiliated fellowship programs exist in Forensic Pediatrics, and the American Board of Pediatrics is considering the recognition of child abuse pediatrics as a boarded subspecialty. Formalized certification and training should lead to increases in the number of pediatricians choosing this rewarding and challenging subspecialty.



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Christine E. Barron, MD, is Assistant Professor of Pediatrics, Brown Medical School.

Carole Jenny, MD, MBA, is Professor of Pediatrics, Brown Medical School.

CORRESPONDENCE:

Christine E. Barron, MD
 Hasbro Children's Hospital Child Protection Program
 593 Eddy Street, Potter-005
 Providence, RI 02903
 Phone: (401) 444-3996
 Fax: (401) 444-7397
 e-Mail: cbarron1@lifespan.org

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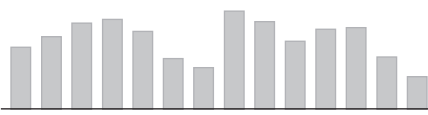


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RHODE ISLAND CHILD DEATH REVIEW KEY FINDINGS: 2000-2002 DEATHS

ELIZABETH A. LAPOSATA, MD, JENNIFER SWARTZ, DO, WENDY VERHOEK-OFTEDAHL, PHD,
ANDREA ALVAREZ, EDWARD F. DONNELLY, RN, MPH, AND JAY S. BUECHNER, PHD

Efforts to prevent child deaths have led to the establishment of child death review programs at the state and local level across the country. “**Child Death Review (CDR)** is ... a collaborative process that brings people together ... from multiple disciplines, to share and discuss comprehensive information on the circumstances leading to the death of a child and the response to that death.”¹

The Rhode Island Child Death and Injury Review Team was formally established in 1998 by the **Rhode Island Department of Children, Youth and Families (DCYF)**. In spring 2004 the review of child fatalities occurring from January 1, 2000, onward became the responsibility of the **Rhode Island Child Death Review Team (RICDRT)**, coordinated by the state’s Chief Medical Examiner. Members include representatives from DCYF; the Department of Human Services; law enforcement; the RI Attorney General’s Office; injury prevention programs; pediatricians representing emergency services, child protection, and primary care; and a Brown Medical School injury epidemiologist.

This report summarizes the initial

findings of the RICDRT based on reviews of child deaths occurring during 2000-2002.

METHODS

The RICDRT reviewed all deaths of children (birth – 17 years of age) due to accidents, suicide, homicide, and **Sudden Infant Death Syndrome (SIDS)** and all deaths with manner unclassified (i.e., undetermined as to intent) that occurred in Rhode Island during 2000-2002. The reviewed deaths were identified through the **Medical Examiner’s (ME)** daily log. Deaths of Rhode Island residents that occurred out of state were not included, as information on these deaths is not available for review.

The RICDRT reviewed information abstracted from source documents contained in the ME record including ME autopsy and toxicology reports, police reports, pre-terminal medical records, child protection records, primary care records and other documents as appropriate. The RICDRT assessed the potential preventability of each death by action at the community and individual level, e.g., education and policy changes.

The review process and method of assessment of preventability are described in detail in the Public Health Briefing in this issue of *Medicine & Health / Rhode Island*.

RESULTS

During 2000-2002 there were 108 child deaths due to non-natural causes and SIDS. Of these deaths, the Medical Examiner ruled 55 to be accidents, 17 to be homicides, 8 to be suicides, 12 to be SIDS, and 16 to be “unclassified as to intent” after a thorough medico-legal investigation. (Figure 1) Of the 108 deaths, 36 occurred in 2000, 31 in 2001 and 41 in 2002.

The preponderance of deaths involved children under age 1 (30.6%) and children aged 15 to 17 years (39.8%) (Figure 2) The majority (65, or 60.2%) were non-Hispanic White race/ethnicity, 16 (14.8%) were Hispanic, 16 (14.8%) were non-Hispanic Black, 8 (7.4%) were Asian, 2 (1.9%) were American Indian, and 1 (0.9%) was of undetermined race/ethnicity.

The greatest numbers of child deaths during the three-year period were those involving **motor vehicles (MV)** (31 deaths) and deaths of infants that occurred while co-sleeping or sleeping on structures not designed for infant use (21 deaths). Of the 31 MV deaths, 23 (74.2%) occurred among children who were occupants of or ejected from cars or SUVs. Of these, 16 (69.6%) involved children who were unrestrained. All unrestrained children were ages 13-17.

The 21 deaths of infants that were co-sleeping or sleeping on structures not designed for infant use (16 deaths and 5 deaths, respectively) accounted for 63.6% of the 33 infant deaths in 2000-2002 that were due to non-natural causes or SIDS. Co-sleeping refers to children sleeping with others. Structures not designed for infant use include couches, futons, air mattresses,

Figure 1. Non-natural and SIDS Deaths Occurring in Rhode Island, by Manner of Death, Ages 0 – 17, 2000 – 2002.

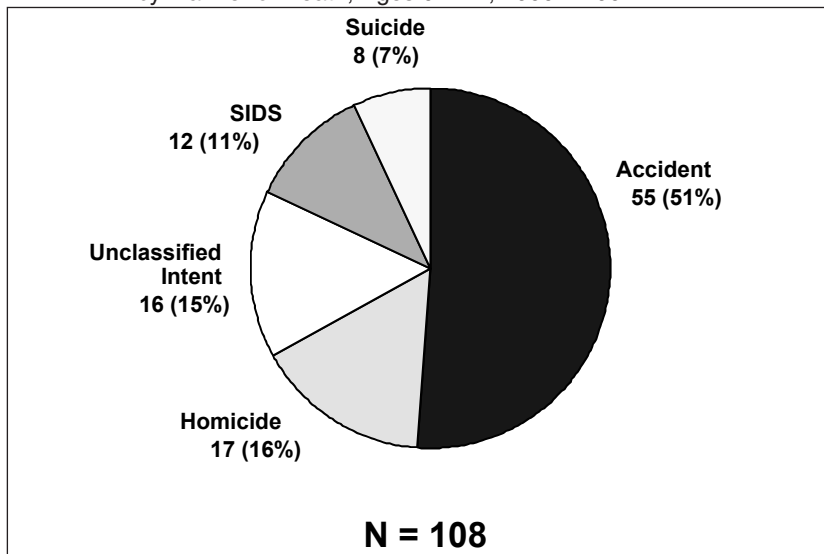
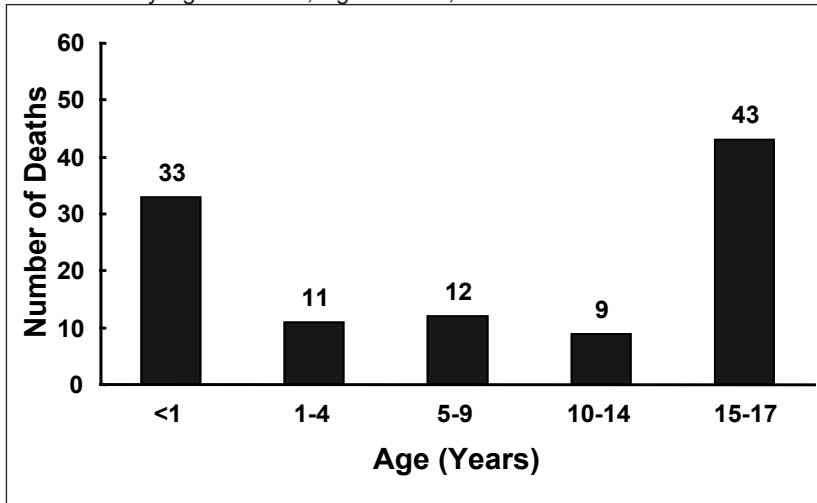


Figure 2. Non-natural and SIDS Deaths Occurring in Rhode Island, by Age at Death, Ages 0 – 17, 2000 – 2002.



waterbeds and other beds designed for adult use. All these deaths occurred among infants ages 6 months or younger; the majority (13) occurred among those ages 1 or 2 months.

The RICDRT initial assessment of preventability indicated that as many as 80% of the 108 reviewed deaths may be potentially preventable by action at the community level and 78% may be potentially preventable by action by individuals. Preventability varied by manner of death, from 50% of SIDS deaths to 100% of homicides that were not related to child abuse. (Figure 3)

DISCUSSION

The RICDRT’s initial review of 108 child deaths due to non-natural causes and SIDS identified MV fatalities and deaths of infants associated with co-sleeping or sleeping on structures not designed for infant use as top priority areas for prevention.

The RICDRT will conduct in-depth, focused reviews of these deaths in order to inform prevention efforts.

The preponderance of teen fatalities associated with motor vehicles is a particular area of concern. Initial areas of focus identified by the RICDRT are the role of driver inexperience, failure to use seat belts, underage alcohol use, excessive speed, and the presence of multiple occupants, notably other teens, in fatal motor vehicle crashes. The in-depth reviews of these deaths will inform prevention efforts such as those of the Department of Health’s SafeRI Violence and Injury Prevention Program.

The RICDRT will also conduct in-depth reviews of infant deaths that occurred while co-sleeping or sleeping on structures not designed for infant use. The results will inform the important prevention activities underway by the Hasbro Children’s

Hospital Child Protection Program and will be shared with child death review teams in other states as well as with the National MCH Child Death Review Program.

The RICDRT is continuing to review current child deaths to identify risk factors, trends, and areas for prevention. Through effective collaboration with government programs and community organizations that develop and deliver prevention interventions and implement policy changes, the team will pursue its goal to keep Rhode Island children alive and healthy.

Elizabeth A. Laposata, MD,

Cited pg 303.

Jennifer Swartz, DO, is Interim Chief Medical Examiner and Clinical Assistant Professor of Pathology and Laboratory Medicine, Brown Medical School.

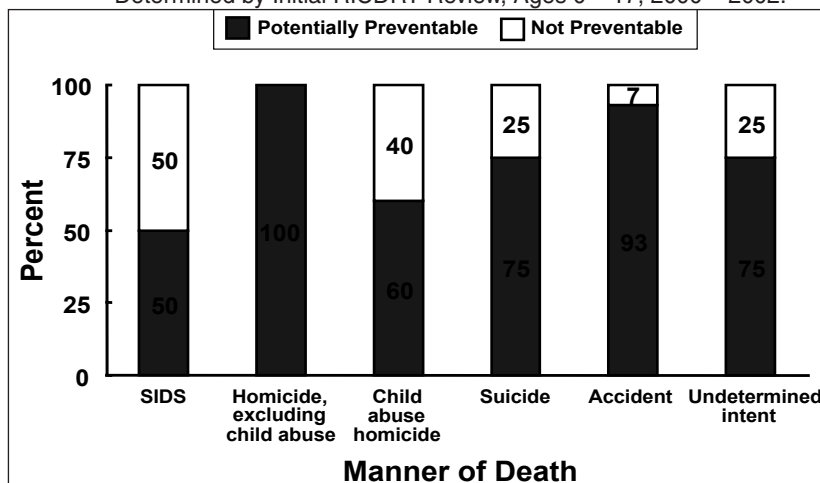
Wendy Verhoek-Oftedahl, PhD, is Assistant Professor of Community Health (Research), Brown Medical School.

Andrea Alvarez is Senior Data Manager/Assistant Epidemiologist, Department of Community Health, Brown Medical School.

Edward F. Donnelly, RN, MPH, is Senior Public Health Epidemiologist, Office of Health Statistics, and Clinical Teaching Associate, Department of Community Health, Brown Medical School.

Jay S. Buechner, PhD, is Chief, Office of Health Statistics, and Clinical Assistant Professor of Community Health, Brown Medical School.

Figure 3. Non-natural and SIDS Deaths Occurring in Rhode Island, by Manner of Death and by Potential Preventability as Determined by Initial RICDRT Review, Ages 0 – 17, 2000 – 2002.



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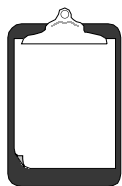
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ERRATUM

In the July 2005 Health by Numbers, there was an error affecting Table 1, which listed the ten most common first-listed diagnoses among hospital inpatients in Rhode Island in 2003, and the accompanying text.¹ The ninth and tenth most common diagnoses should have been “Chronic Bronchitis” and “Osteoarthritis and Allied Disorders.”

The corrected article may be accessed at the website of the Rhode Island Department of Health: <http://www.health.ri.gov/chic/statistics/hbn.php>.

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PUBLIC HEALTH BRIEFING

RHODE ISLAND DEPARTMENT OF HEALTH

DAVID GIFFORD, MD, MPH, DIRECTOR OF HEALTH

EDITED BY JOHN P. FULTON, PHD

RHODE ISLAND'S CHILD DEATH REVIEW TEAM

ELIZABETH LAPOSATA, MD, AND WENDY VERHOEK-OFTEDAHL, PHD

The death of a child is a singularly tragic event. Especially tragic is a death that could have been prevented.

Originally child death review teams were established to identify and to prevent child deaths caused by abuse and neglect. However, like a number of other states, Rhode Island has opted for a broader review process that addresses all preventable child deaths from a public health perspective. This approach not only addresses maltreatment-related deaths but also promotes better understanding and greater awareness of all the causes of child deaths.

HISTORY

In 1998 the Rhode Island Department of Children, Youth and Families (DCYF) established the Rhode Island Child Death and Injury Review Team (RICDIRT) to review deaths and serious injuries of children in the state. In 2004, the RICDIRT responsibilities were divided. The review of fatalities became the responsibility of the Rhode Island Child Death Review Team, organized under the Rhode Island Medical Examiners Office. Beginning with the review of calendar year 2000 child deaths, the Chief Medical Examiner has coordinated the Rhode Island Child Death Review Team.

MISSION AND GOALS

The RICDIRT is committed to the systematic multidisciplinary comprehensive review of child deaths. It is designed to provide detailed information beyond that available from analysis of death certificates alone. These findings can be used by community-based partners, legislators, and public policy makers to take action to prevent other deaths and improve the safety and well-being of all children. The ultimate goal of the team is to reduce the number of child deaths in the state.

OPERATION OF CHILD DEATH REVIEW TEAMS

Child fatality team members represent many disciplines, including investigation, healthcare, or other service delivery.^{1,2}

Even team members that might not consider themselves to be in a preventive role contribute to the identification of potentially premature death. For example, law enforcement officers know the causes of motor vehicle crashes. Prosecutors understand the legal remedies in child abuse and neglect. Pediatricians understand the challenges of health care delivery. The medical examiner knows the circumstances and causes of death. DCYF knows the complexity of monitoring the safety of children.

Teams approach the analysis of child fatalities systematically.^{3,4} They start their review of deaths due to injuries by

- Knowing where and how often they occur;
- Understanding who is most at risk and why;
- Postulating effective interventions that might have immunized them or other children from

harm; and

- Understanding that injuries to children do not just happen at random but are predictable and understandable, and, therefore preventable.

The team need not design and implement the prevention activity, but the team is the catalyst of information and can be key in connecting with crucial resources and community partners.

The team can also foster accountability as well as recognize and reward community efforts.

OPERATION OF THE RHODE ISLAND CHILD DEATH REVIEW TEAM

The RICDRT is a multidisciplinary team that reviews childhood deaths to identify risk factors and trends, and to inform prevention efforts. [Table 1] The Team is not a peer review of agencies or organizations, or of medical practice. It examines systems issues and potential preventability of deaths, not the performance of individuals. In Rhode Island, all deaths under 18 years of age regardless of cause must be reported to the Medical Examiners

Table 1
Agencies Represented by Rhode Island Child Death Review Team

⊙ Department of Health: Medical Examiners Office Division of Family Health Safe Rhode Island Violence & Prevention Program
⊙ Department of Children, Youth & Families
⊙ Pediatrician: American Academy of Pediatrics
⊙ Child Protection Program, Hasbro Children's Hospital
⊙ Department of Human Services
⊙ Brown University Department of Community Health
⊙ Law Enforcement : Naval Criminal Investigative Services Brown University Department of Public Safety
⊙ Pediatric Emergency Department
⊙ Injury Prevention Center, Rhode Island Hospital
⊙ Child Advocates Office
⊙ Office of Attorney General

Office [Gen laws 4-7(2e)]. This allows for a complete database of all child deaths.

Beginning with the review of child deaths in 2000, Rhode Island child death review has been a two-step process.^{5,6,7} First, the RICDRT conducts initial reviews of child deaths. Second, the RICDRT conducts in-depth case reviews based on interests identified from the initial reviews..

The initial child death review process is as follows:

1) Prior to team review, the details of each death are abstracted by the National **Maternal and Child Health (MCH)** Center for Child Death Review. A trained data manager abstracts the information, including autopsy, police, hospital, and social service records. The information is entered into the Rhode Island Child Death Review database. Ultimately, Rhode Island will participate with 16 other states to pilot the MCH Bureau National Child Death Review Surveillance System. Computerization of data will then be conducted using web-based software supported by the MCH Bureau National Child Death Review Program that will also enable de-identified Rhode Island data to be combined with de-identified data from other states for the initial phase of a National Child Death Review Surveillance System.

2) At the time of the RICDRT review meeting, the history and autopsy findings for each death are presented from the Medical Examiner's case summary and from the abstracted information compiled from Medical Examiner investigator reports, police reports, medical records, child protective services records, and interviews with witnesses and other involved parties.

3) Team members then discuss the characteristics and circumstances of each death, and assess the potential for preventability (see below). If members request, scene and autopsy photographs are presented. If members wish additional information, RICDRT support staff will obtain it by the next meeting.

ASSESSMENT OF POTENTIALLY PREVENTABLE DEATHS

There is no common or national standard for the definition

of preventability; however, most of the states involved in the child review process have adopted a similar definition: A child's death is considered to be preventable if the community (education, legislation, etc.) or an individual (reasonable precaution, supervision, or action) could reasonably have done something that would have changed the circumstances that led to the child's death.⁵

The designation of preventable does not imply that the death was caused by child abuse or neglect, or could absolutely have been prevented, but that reasonable intervention(s) might have prevented the death. *Reasonable* is defined by taking into consideration the circumstances and resources. Reasonable interventions are considered to be sensible, prudent, and suitable under the circumstances; not extreme or excessive. A death may be considered potentially preventable at the individual level only, community level only, or both the individual and community level.

The RICDRT members discuss the degree of preventability of each death at both the individual and community level by asking what key risk factors allowed the death to occur. The RICDRT members then classify each death as one of the following:

Definitely preventable when the death could have in most cases been prevented with reasonable intervention.

Probably preventable when the same certainty that exists in the category of "definitely" does not exist.

Probably not preventable when the child might still have died even with reasonable intervention.

Definitely not preventable when the death would have occurred regardless of any and all attempts at intervention.

All members sign confidentiality statements before sharing information.

The second step in the RICDRT process is organizing the potentially preventable deaths into groups with similar circumstances. Using detailed, state-specific data on risk factors and circumstances surrounding child deaths, the RICDRT will begin the process of developing recommendations for community and individual-level action. Formal recommendations

will be developed by the RICDRT in conjunction with prevention experts as well as governmental, professional and community agencies, and other stakeholders. To the extent possible, RICDRT will utilize existing resources such as task forces and coalitions currently involved in prevention activities in order to coordinate RICDRT work with existing efforts.

SUMMARY OF RHODE ISLAND CHILD DEATH REVIEW TEAM FINDINGS

From the review of 2000-2002 child deaths, the RICDRT identified two areas in need of immediate prevention intervention: 1) deaths due to motor vehicle accidents, and 2) deaths of infants co-sleeping with adults or sleeping on structures not designed for infant use. These are reported in more detail in the associated article Health by Numbers.

Once the in-depth reviews of child deaths associated with infant co-sleeping and with motor vehicle accidents have been completed, other groups of potentially preventable deaths will be prioritized for review. At the initial reviews of child deaths, RICDRT members informally proposed a number of potential prevention strategies at the community and individual level for consideration. Some of these strategies are presented here to illustrate the interventions under discussion.⁴

• *Homicide*

- Examples of community-level action identified as having the potential to reduce homicides were the implementation of urban planning techniques to render neighborhoods less hospitable to gangs and drug traffickers, increased community policing, community involvement to increase neighborhood safety, and control of firearms.^{6,7}
- Examples of individual-level action identified as having the potential to reduce homicides were individual's use of anger management techniques as well as increased parental supervision of children's activities and vigilance regarding weapon possession.
- *Child Abuse Homicide*
 - An example of community-

level action cited as having the potential to reduce child abuse homicide was public education regarding Shaken Baby Syndrome.

- An example of individual-level action cited by members was utilization of appropriate parenting techniques by both fathers and mothers.
- *Youth Suicide*
 - Examples of community-level strategies to reduce youth suicide suggested by RICDRT members included implementation of school programs to reduce bullying and increased provision of mental health services for children.
 - Examples of individual-level action included increased parental supervision and parental action to ensure that firearms are not readily accessible.
- *Dwelling Fires*
 - Examples of community-level strategies suggested to reduce deaths in dwelling fires were stronger enforcement of building codes such as those pertaining to wiring and maintaining means of egress, and public education regarding the importance of maintaining working smoke detectors, planning escape routes, and not overloading electrical outlets.
 - Examples of individual-level strategies suggested included parental supervision of children, maintaining working smoke detectors, planning escape routes, ensuring that electrical outlets are not overloaded, and reporting landlords for code violations.

In the future, in-depth reviews of other types of death will be conducted and formal strategies for prevention developed.

PREVENTABILITY APPROACHES

The situations that lead to child death are complex. Quick long-term solutions are not to be expected. Prevention programs take time and effort to design and implement, and often more time to impact the lives of children. Moreover, any changes

Table 2
Levels of Prevention

• Strengthening Individual Knowledge and Skills
• Promoting Community Education
• Educating Providers
• Fostering Coalitions and Networks
• Changing Organizational Practices
• Influencing Policy Legislation

may require consistent attention, or, in some cases, permanent attention to sustain them.

For example, RICDRT data-based recommendations could be used to drive the Spectrum of Prevention model programs to be used to create long-lasting, positive changes in the community.⁸ This model describes the levels at which prevention activities can occur. [Table 2]. It moves beyond individual services (level one) and community education (level two) to include training providers (level three), building partnerships (level four), changing what organizations do (level five), mobilizing neighborhoods and communities (level six) and influencing policy (level seven). Although each community will have its own ways of preventing injuries, efforts are more successful when the projects complement existing injury prevention efforts. Since problems are often complex, the best solutions are usually obtained with a comprehensive multidisciplinary approach.

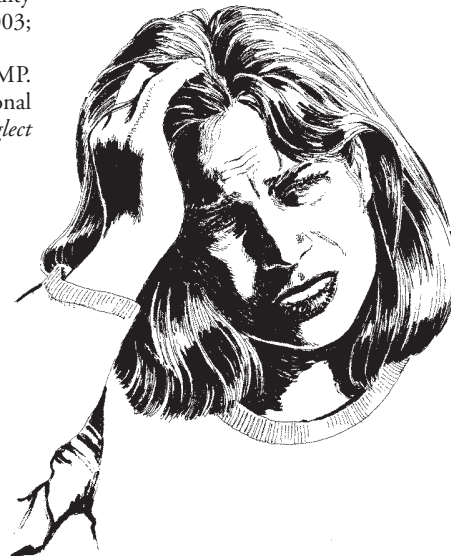
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Wendy Verhoek-Oftedahl, PhD, is
Assistant Professor of Community Health
(Research), Brown Medical School.

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BOOK REVIEW

Vascular Dementia. Cerebrovascular Mechanisms and Clinical Management. Edited by Robert H. Paul, PhD, Ronald Cohen, PhD, Brian R. Ott, MD and Stephen Salloway, MD (Human Press as part of the "Current Clinical Neurology Series"). The authors are faculty members in the Department of Psychiatry and Human Behavior and the Department of Clinical Neurosciences, Brown Medical School.

REVIEWED BY JANET WILTERDINK, MD

Alzheimer's disease dominates the field of dementia both epidemiologically and in the medical and popular press. At the same time recent attention has also been provided to 'newer' causes of dementia - eg. diffuse Lewy body disease and frontotemporal dementia. The result is that vascular dementia is relatively neglected in the consideration of physicians. The publication of this text serves to remind us of this important clinical entity and bring its readers up-to-date on the extensive clinical and basic science work that has been done in this area over the past several years.

The book provides a multidisciplinary review of the current understanding of vascular dementia. Sections are devoted to basic mechanisms, clinical and social sequelae, neuroimaging and clinical management. Particular emphasis is placed on the interaction between vascular and Alzheimer's dementias in a dedicated section with five chapters.

Learning about vascular dementia is challenging; there is considerable controversy over its definition, diagnosis and treatment even its existence. Terminology is also in a state of flux. The book does an excellent job at presenting and clarifying many of these issues. In areas that are either somewhat controversial or in which clear answers are still wanted, the editors and authors are to be commended for presenting careful, thoughtful, evidence-based reviews with open acknowledgement of knowledge gaps. The text is current and extensively referenced. The tables and figures are well presented. There is an appropriate balance between basic science and practical clinical information. While any clinician taking care of patients with dementia will find much of value in this book, I suspect that its main appeal will be for clinical researchers in this area.

Janet Wilterdink, MD, is Associate Professor, Department of Clinical Neurosciences, Brown Medical School.

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THE GENESIS PROJECT: CULTURE CHANGE AT THE MIRIAM HOSPITAL

LYNN MCNICOLL, MD, FRCPC, LISA BAUMHOVER, MSN, RN, PHYLLIS J. MCBRIDE, MS, RN

This article is the last of a series on culture change in the hospital toward patient-centered care that focuses on optimizing care, outcomes and patient safety.¹ Rhode Island continues to be a leader in healthcare. In the August issue, we introduced the Rhode Island Intensive Care Collaborative, which will begin in the fall of 2005. This article features The Miriam Hospital's GENESIS project, a culture change initiative targeting improving the care of the older hospitalized patients that resulted in significant improvements in patient care.

PROGRAM DESCRIPTION

In 2002, The Miriam Hospital administration decided to dedicate significant resources and energy into improving the care of older persons hospitalized at their facility. GENESIS was created and is an acronym for "Promoting a Geriatric-friendly Environment through Nursing Evaluation and Specific Interventions for Successful Healing". Over 60% of patients admitted to The Miriam Hospital are 65 years of age or older and recent medical literature showed promising outcomes with minor modifications in routine nursing care. Studies have shown that by improving ambulation, nutrition, and sleep patterns during hospitalization, we could prevent delirium by 33%.² Delirium is associated with other significant negative outcomes including falls, pressure ulcers, worsening function, need for rehabilitation, aspiration pneumonia and death. Thus, by optimizing ambulation, nutritional intake, and sleep, the goal was to prevent delirium and improve overall outcomes.³ The question remained how to accomplish this without taxing the nursing staff and overburdening them.

The strategy was three-fold: education, environmental changes, and culture change. Nurses and **Certified Nurse Assistants (CNAs)** were trained intensively for three full days by a multidisciplinary team of instructors about geriatric issues and the evidence-based medical literature supporting these interventions. Most of the training focused on 'Back-to-Basics' nursing education; restraint reduction and alternatives, pressure ulcer prevention strategies, fall prevention, proper mobilization techniques, polypharmacy, non-pharmacological sleep protocols and delirium prevention.

Environmental changes were also introduced, such as noise reduction strategies, and reduction in hallway clutter to allow for hallway ambulation of patients. The tools and equipment to perform the tasks were provided and easily accessible on the units, including: wheeled walkers, gait belts, CD players and CD's for relaxing music, hearing

amplifier devices for the hearing impaired to optimize communication, and nutritional supplements.

Culture change involved reorganization of the nurse-CNA relationship and refocusing around patient-centered care. Nurses and other healthcare providers in the hospital are often required to perform time-consuming tasks such as proper documentation and discharge preparation that take them away from direct patient care. By reorganizing the structure and use of CNAs, we hypothesized that nurses could perform the same tasks previously required and provide the basic nursing care as prescribed in GENESIS without creating excess burden. Instead of using CNAs to take vital signs and give bed baths, they helped to mobilize the high-risk patients twice a day, assisted with meals for malnourished patients, and implemented the non-pharmacological sleep protocol (a warm drink, back rub, and relaxing music). The non-pharmacological sleep protocol has been shown to be more effective than a sleeping pill.⁴ CNAs were properly trained in recognizing cognitive and physical changes in patients and alerted nurses of early signs of delirium. They were also trained in the proper method of safe ambulation of ill patients and how to optimize nutritional intake in patients with delirium and dementia.

Patients were enrolled in any of three GENESIS protocols depending on their baseline risk for developing problems with nutrition, mobility or sleep. On admission to the hospital, the nurse would identify someone at risk and enroll them immediately. The multidisciplinary team at The Miriam Hospital included a geriatric nurse specialist, a geriatrician, pharmacist, nutritionist, physical and occupational therapists, and staff nurses and CNAs. This team developed the protocols and designed a one-page reference kept at the bedside for use by nurses and CNAs on strategies to improve ambulation, nutrition, and sleep.

RESULTS/SUCCESS

The GENESIS program has demonstrated significant improvements in patient care, which translates into improved patient and staff satisfaction. GENESIS started on one pilot medical-surgical unit in late 2002 and over 2 years of results are available for that unit.

Improved management of delirium was demonstrated by the decreased use of one-on-one companions and physical restraints for agitated patients, by 70% and 19% respectively. Hospital-acquired pressure ulcer rates declined by 60% within one year. Hospital fall rates did increase during the first year of the program but these were mainly assisted falls occurring while being ambulated by an aide. Injurious falls

declined by 11%. Patient satisfaction with nursing care and with pain management improved significantly for that unit for two years following the program. As noted above, many of these improvements are JCAHO and CMS approved quality indicators (falls, pressure ulcers, restraint use). One program, GENESIS, can affect significant changes in these important quality measures essentially by mobilizing patients, feeding them better and allowing them to sleep.

CULTURE CHANGE

Changing and adopting new healthcare practices require significant culture change to ensure achievement. Successful culture change include commitment to the following areas: administrative support, staff buy-in, and evidence-based approaches.

Administrative support is extremely important with any hospital initiative. The message to staff should be that the hospital leadership considers the project a priority. Unit manager support and active involvement is also essential to relay a consistent message to staff nurses from all levels of management. On-going financial support for the educational and equipment costs are necessary for sustainability.

Staff buy-in cannot be overly emphasized as an essential component for culture change. The basis of staff buy-in is education of evidence-based principles in the context of daily care. Using clinical examples from the hospital, or preferably from the GENESIS unit, can help illustrate alternative strategies for caring for older persons and bring the message closer to heart. When principles are relayed on a personal and intimate level, staff members become less resistant to change. Some staff members will always be resistant to change. These so-called 'core resisters' were invited into the project teams and encouraged to articulate their concerns.

Once culture change has impregnated one unit and success becomes visible, it can become infectious. Other units may start paying attention and requesting the same program. Patients and family members may begin requesting the same geriatric care for themselves and writing letters to the CEO. Physicians may notice the attitudinal change of the nurses and request that their patients be admitted to "culture change" units. Surgeons may notice that their post-operative patients seemed to recover more quickly and suffer fewer complications. Positive feedback to the nurses on the "culture change" unit increases their self-confidence and pride. Culture change does not happen overnight and needs continuous attention for sustainability.

FUTURE DIRECTIONS

Given the success of the GENESIS project, the program has been disseminated to three other units at The Miriam Hospital and will be extended to the last two medical-surgical units in the fall. GENESIS principles could be potentially introduced in the emergency room, as well as in intensive care units. Other hospitals in the region have shown significant interest in introducing GENESIS into

their hospital environment. Potential cost savings from prevention and better management of delirium are also of interest to hospital administrators and are being investigated. The GENESIS project is a shining example of the feasibility of culture change supported by a multidisciplinary team and multifaceted strategy. It is also an example of the tremendous benefits of culture change in the hospital setting.

Lynn McNicoll, MD, FRCPC, is chief geriatrics consultant to The Miriam Hospital and project leader for the GENESIS project. She is also the clinical consultant to Quality Partners of Rhode Island for the hospital quality indicators and Assistant Professor, Department of Medicine, Brown Medical School.

Lisa Baumover, MSN, RN, is a clinical nurse specialist in geriatrics and project manager for the GENESIS project at The Miriam Hospital.

Phyllis J. McBride, MS, RN, is Project Coordinator at Quality Partners of Rhode Island.

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CORRESPONDENCE:

Phyllis McBride, MS, RN
Quality Partners of Rhode Island
235 Promenade Street, Suite 500
Providence, RI 02908
e-mail: pmcbride@riqio.sdps.org

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A PHYSICIAN'S LEXICON

THE HEART OF THE MATTER

Human sacrifice probably provided ancient man with his first visual inspection of the internal organs of the human body. Of the many revealed anatomic structures, the heart and its various vascular connections attracted the most attention. Certainly its rhythmicity distinguished it from the other viscera and, accordingly, it was viewed as the source of consciousness, wisdom and energy.

Every language has its complement of cardiologic terms. The Latin, *cor*, meaning heart, has given rise to such English words as cordate [heart-shaped], cordial [from the heart; or, as an aperitif, one which stimulates the heart], concord, accord [harmony] and accordion [an instrument to create harmony]. *Cardia*, a Greek word, is the basis for words such as myocardium, pericardium and endocardium. English words such as carnal, carnival, carrion and carnivorous, however, are derived from the Latin, *carnia*, meaning flesh. Ventricle is from the Latin, *ventriculus*, diminutive of *venter*, meaning belly [and hence, ventral indicating the direction toward the belly]. The Latin *atrium* defines the central courtyard of the Roman villa and was later used to describe two of the cardiac chambers. The name may have originated in the Etruscan town of Atria from whence the architectural style incorporating the central atrium had originated.

The word coronary is derived from the Latin, *corona*, meaning wreath, crown or that which encircles. It has generated such English words as coronet, coronation, coroner [originally, a guardian of royal property] and, of course, coronary arteries [arteries which encircle the heart].

The chordae tendinae derive their name from a Greek word meaning to stretch, and the Latin, *chorda*, meaning rope-like. The Franciscan friars, sometimes called the Cordeliers, were so-named because of their custom of using ropes as belts.

Aorta descends from a Greek word meaning to lift up or to sustain. It may have been derived from a still older Macedonian term for a scabbard since, it is said, some warriors used the curved aortic arch [derived from slain enemies] as a sheath for their daggers. The mitral valve derives its name from the Latin *mitra*, meaning cap or turban. It was applied to the bicuspid valve proximal to the left ventricle by Vesalius because of its resemblance to the bicuspid hats [miters] worn by bishops.

Vein is from the Latin *vena*, meaning to arrive or to come. The Latin adjective *cava* [as in vena cava] means empty since the major veins after death appeared to be devoid of blood.

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