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May 27, 2018

TO: Mark Zigler, Co-Lead Commission Counsel
Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System
400 University Avenue
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Toronto, Ontario M7A 2R9

RE: *Expert Review for the Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System*

Thank you for asking me to provide opinions as set out in your letter of April 20, 2018, attached in **Tab A**.

In brief, I obtained my BS in Nursing in 1975, my Master's in Child Psychiatric Nursing in 1978 and my JD in 1988. I am a Professor of Nursing, Criminal Justice and Criminalistics at California State University, Los Angeles. Currently I teach baccalaureate nursing students on a Geriatric Psychiatric unit at Verdugo Hills Hospital in Los Angeles. I retired as Dean of the College of Health and Human Services in 2015, prior to that I was the Director of the School of Nursing at San Francisco State University and Professor of Psychiatric Nursing at Georgia State University. In addition to my academic positions, I have served as a consultant for prosecutors, law enforcement, defense attorneys and legal teams on cases involving nurses investigated for serial murder of patients in their care in healthcare settings. I have also trained forensic nurses, hospital risk managers and others regarding crime in hospitals. I was appointed to the American Hospital Association (AHA) and Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) work group on Patient Safety and Protection from Malicious Healthcare Providers from 2004 to 2008 and I served as a consultant on "serial murder by nurses" and dealing with "rogue healthcare providers" for the National Council of State Boards of Nursing (NCSBN) and the National Nurses Association. My clinical work included working as a psychiatric nurse at San Francisco General Hospital and on the Child and Adolescent Psychiatric Consultation Liaison Service of Grady Memorial Hospital/Children's Healthcare of Atlanta. I have published over 40 articles in refereed journals on Munchausen by Proxy, serial murder in healthcare and other forensic nursing topics. A copy of my Curriculum Vita is attached under **Tab B**.

Below are my responses to your questions:

1. **Based on your review of the data, as outlined in your papers entitled "Serial Murder by Healthcare Professionals", 2006, and "Healthcare Serial Murder: A Patient Safety Orphan", 2010 and any updated data, is there a phenomenon of health care serial killers?**

There is evidence to suggest that serial murder in healthcare settings is a phenomenon. In my initial paper, "Nurses Accused of Murder" published in the *American Journal of Nursing* in 1988, **Tab C.** I reviewed nine prosecutions of nurses for murder of patients in their care and suggested these were not isolated incidents. I identified some patterns and similarities identified by unexpected clusters of patient deaths on a specific patient care unit, e.g. injectable medications were the predominant suspected agent, incidents occurred on the evening or night shift and presence of a specific nurse was correlated with the suspicious or increased cardiac arrests and deaths. I also cautioned that some of prosecutions resulted in violations of nurses' due process, and resulted in acquittals and overturned convictions.

Further support that serial murder by nurses is a phenomenon of concern in the medical setting occurred following a series of articles published in prestigious medical journals such as the *New England Journal of Medicine, JAMA* and *Critical Care Medicine* regarding "nurse associated epidemics" describing studies conducted by the Centers for Disease Control and Prevention (in Atlanta, GA) on epidemics of suspicious cardiac arrests, deaths, and nurse-associated epidemics found in specific patient care areas [1 2 3 4 5 6]. Kenneth Rothman wrote an editorial of the *New England Journal of Medicine* entitled "Sleuthing in Hospitals" expressing alarm that two epidemics could be associated with the presence of a nurse. He challenged the readership to go beyond the published exercises in applied epidemiology and to delve into the underlying causes of how nurses could be responsible for epidemics of patient deaths and cardiac arrests[7]. I endeavored to rise to that challenge. In 1994, I published An Analysis of Murder Charges Against Nurses in the *Journal of Nursing Law*, **Tab D,** examining prosecutions, evidentiary issues and outcomes of the trials of twelve nurses charged with murder. Researchers in the United Kingdom and other countries contacted me as a result of these publications. They were also investigating nurse associated clusters of patient deaths and prosecutions of nurses, physicians and ancillary healthcare providers. They were labelling this phenomenon as Caregiver Associated Serial Killings (CASKs), or Health Care Serial Killings (HCSKs). These terms are now found in the literature.

In 2002, I assembled a team including Robert Forrest, a forensic toxicologist involved in several prosecutions in the United Kingdom, Paula Lampe, a nurse author who was tracking HCSKs in Europe and Kenneth Kizer, founder of the National Quality Forum in Washington, DC who had served as Undersecretary for Health for the Department of Veterans Affairs (VA), the largest

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[1] Stross JK, Shasby, DM, Harlan WR, An epidemic of mysterious cardiopulmonary arrests. N Eng J Med 1976;295:1107-10.

[2] Istre GR, Gustafson TL, Baron RC, Martin DL, Orlowski JP. A mysterious cluster of deaths and cardiopulmonary arrests in a pediatric intensive care unit. N Eng J Med 1985;313:205-11

[3] Beuhler JW, Smith LF, Wallace EM, Health CW, Kusiak R. Unexplained deaths in a children's hospital: an epidemiologic assessment. N Eng J Med 1985;313:211-6.

[4] Sacks JJ, Stroup DF, Will ML, Harris EL, Israel E. A nurse-assisted epidemic of cardiac arrests in an intensive care unit. JAMA 1988;259(5):689-95.

[5] Sacks JJ, Herndon JL, Leib SH, Sorhae FE, McCaig LF. A cluster of unexplained deaths in a nursing home in Florida. Am J Pub Health 1988;78:806-8.

[6] Franks A., Sacks JJ, Smith JD, Sikes RK. A cluster of unexplained cardiac arrests in a surgical intensive care unit. Crit Care Med. 1987 Nov;15(11):1075-6.

[7] Rothman, K.
Sleuthing in Hospitals (Editorial) N. Engl. J. Med. 313:258-260, July 25, 1985.

provider of healthcare in the nation, when they had experienced several HCSKs. Our 2006 article in the *Journal of Forensic Sciences* analyzed data on **90 prosecutions** for serial murder by healthcare professionals, attached in **Tab E**.

An updated LexisNexis search found **41 new prosecutions**, bringing the total number to **131 prosecutions of healthcare providers for murder and/or assault of patients in their care since 1970**. We excluded murders by healthcare professionals that occurred outside the work setting, e.g. date rape or domestic violence; we excluded murders for motives such as revenge or inheritance; we excluded prosecutions for authentic euthanasia (with informed consent); we excluded murder charges in the healthcare setting that were the result of gross negligence and we excluded one nurse who was initially charged with serial murder, but the subsequent investigation revealed that the wrong nurse had been arrested and another nurse was linked to the deaths[8]. The updated spreadsheet of 131 total prosecutions consists of four sections: 1. Convictions; 2. Acquittals, successful appeals and dropped charges; 3. Acquitted, BUT, found liable in civil suits for wrongful death; 4. Pending trials and unknown outcomes are attached in **Tab F**. The 41 new cases we identified since our 2006 article are also on a separate spreadsheet, **Tab G.**

Of the total 131 prosecutions, 90 have been convicted for murder and/or assault of patients in their care. Of the remaining 41:

- Six successfully appealed their initial convictions
- Seventeen were acquitted (three of these were found liable for civil damages ranging from $450,000 to $27 million)
- Seven had the charges dropped
- Two were found mentally unfit to stand trial
- One committed suicide awaiting trial
- Four are awaiting trial and
- Four outcomes are still unknown.

The fact that 90 healthcare providers have been successfully convicted supports that HCSK is a phenomenon that goes well beyond isolated instances that are sometimes described in news articles about a healthcare serial killer. The numbers in **Tab F and G** are limited to cases published in LexisNexis, Westlaw and in searchable internet outlets. We did not include investigations that I have consulted on that have not resulted in a prosecution. The data do not include investigations of clusters of adverse incidents associated with the presence of a particular healthcare provider that were investigated by a licensing body and not published, that occurred as a result of internal investigations which have not been adjudicated, or that did not result in an arrest. The data that follows differentiates whether the numbers are of the total 131 prosecuted, or are limited to the 90 convicted. Some of the figures that follow compare data from the 2006

[8] Nurse Nelles at Toronto Sick Children's Hospital in Toronto, Canada was arrested following a number of suspicious deaths associated with post-mortem levels of high Digoxin, however in an epidemiologic study conducted by the Centers for Disease Control in Atlanta, GA, another nurse, Nurse A, was found to be present for all 39 suspicious deaths. She died and it remains an unsolved crime, however we included the arrest of Nurse Nelles as "dropped". Rebecca Leighton was initially charged with insulin overdoses at Stepping Hill Hospital in England, but was released when the evidence pointed to Victorino Chua who was convicted for injecting IV bags with insulin. We excluded her prosecution.

article of 90 prosecutions to data on the 41 prosecutions that were identified since then, to examine whether there have been changes over time.

While the numbers of healthcare providers who have been prosecuted for serial murder of patients in their care certainly suggest a phenomenon, the reader is encouraged to exercise caution before drawing conclusions based on the limited numbers contained in the data sets included in this report. The charts and figures below are included to provide summary and visual illustrations of the data set forth in **Tab F and G.**

The percentage of prosecutions of HCSKs that are convicted is interesting. Of our initial 90 prosecutions, 63 were convicted without a successful appeal. Ten were acquitted, six successfully appealed, and six were dropped. We removed two who were unfit to stand trial, one who committed suicide while awaiting trial and the 2 outcomes still unknown to arrive at a **conviction rate of 74%.** Of the 41 new prosecutions since our 2006 article, 27 have been convicted, 7 were acquitted and one had the charges dropped. We took out the four pending prosecutions and two unknown outcomes to arrive at a **conviction rate of 77%.** Overall, convictions have remained steady since the 1970's, at a rate of **75% of the 120 known prosecution outcomes**.

2. What is the extent of the phenomenon worldwide?

We have identified 131 prosecutions and 90 convictions in 25 countries[9]. The United States has the most prosecutions followed by Germany and Great Britain. The phenomenon first appeared in the United States, Scotland, Canada and Great Britain. Below is the number of prosecutions by country.

Table 1. Prosecutions and Convictions by Country

Country	# Prosecutions	#Convictions
Australia:	3	3
Austria:	4	4
Belgium	7	5
Brazil:	3	2
Canada	2	1
Czech Republic:	2	1
Egypt:	1	1
England:	12	9
Finland:	2	2
France:	2	1
Germany:	20	15
Hungary:	1	1
Ireland:	2	1
Italy:	6	4
Japan:	3	2
Netherlands:	4	2
Norway:	1	1
Poland:	4	4
Russia:	5	1
Scotland:	1	0
Spain:	1	1
Switzerland:	1	1
United States:	40	28
Uruguay	2	0
Wales	2	0
Countries 25	**Cases 131**	**Convictions 90**

The number of convictions in the United States remained steady during the 1980's, 1990's and 2000's (12, 10 and 12 respectively). However, the USA had the majority of prosecutions (75%) and convictions (77%) during the 1980's. Since then, the percentage in the USA dropped to 40% of the prosecutions and 33% of the convictions in the 1990's, only 20% of the prosecutions and 23% of the convictions in the 2000's and **only 16% of the prosecutions and 14% of the convictions since 2010.** There are two additional cases pending in the USA which will be

[9] Michael Swango, MD was investigated, prosecuted and served time in the USA, then moved to Zimbabwe where he was again investigated for poisoning and killing patients. He was ultimately apprehended and convicted in the USA with the assistance of the Zimbabwe government.

discussed further under question #8. The most prosecutions of HCSKs occurred from 2000 to 2010 globally, with a total of 60 during that decade.

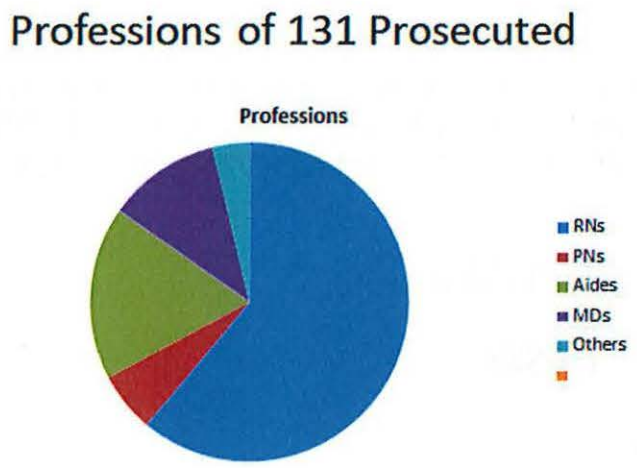
Table 2. Prosecutions by Decade			Convictions by Decade	
1970's	5	(2 in USA, 40%)	2	(0 in USA, 0%)
1980's	16	(12 in USA, 75%)	13	(10 in USA, 77%)
1990's	25	(10 in USA, 40%)	21	(7 in USA, 33%)
2000's	60	(12 in USA, 20%)	40	(9 in USA, 23%)
2010-2018	25	(4 in USA, 16%)	14	(2 in USA, 14%)
TOTAL	**131**		**90**	

While it does appear that the numbers are going down in the USA, and increasing from the 2000's to date in other countries, there are some other decreases. Since our 2006 article was published, Britain has had only 2 new prosecutions (both convicted) out of 12 total prosecutions and Germany also has had relatively fewer with 6 new prosecutions (5 convicted) out of 20 total prosecutions. On the other hand, Italy has 5 new prosecutions (3 convictions) since 2006, compared to only 1 previous conviction. Uruguay and Japan have had 2 new prosecutions compared to zero and 1 respectively, in the prior study.

The total number of patient deaths that resulted in a murder conviction is at least 450, the number of patient injuries that resulted in convictions of assault or grave bodily injury is at least 150. The number of suspicious deaths attributed to the 90 convicted HCSKs is in excess of 2,600. These numbers are concerning, particularly in the cases that go on for decades, or that involve many more deaths than were initially estimated.

The professions of the 131 prosecuted HCSKs include Registered Nurses 80, Practical Nurses 8, Aides 23, Physicians 15, and other personnel, 5. Nursing staff continue to be the majority at 85%. This has been a consistent percentage between our original number (86%) and present.

Figure 1. Professions of the total number of those prosecuted



These numbers are still very small. The chances of being killed by a healthcare serial killer are extremely low, estimated to be less than 1 in 2 million healthcare providers[10]. Caution should be exercised before drawing any conclusions with the data sets provided here.

3. Are any particular patient groups particularly vulnerable to the phenomenon? Which groups, and why?

Patients who are critically ill, elderly, mentally compromised, frail, very young or infants are over-represented victim populations in our studies. The reasons for this are similar to the increased vulnerability of these populations to be abused or assaulted in any setting. These patient populations have decreased capacity to recognize abuse, identify perpetrators, speak about it, resist it, or report it. These populations are particularly vulnerable to abuse of any type in a healthcare setting (sexual assault/molestation, elder abuse, battering, starving, neglect and verbal abuse) and even more vulnerable to insidious abuse such as overmedication, injection, smothering, or equipment tampering, as those methods do not leave obvious bruising or signs of physical abuse and neglect. As patients in a healthcare setting, these populations may be further compromised by medications, delirium, dementia, or coma.

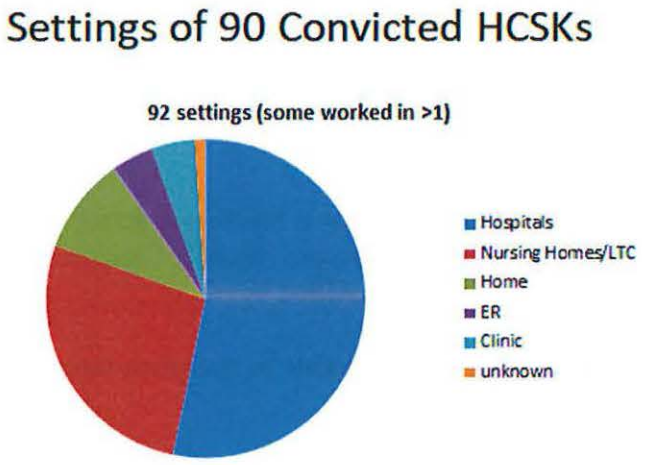
However, some serial killers have been able to kill or assault ambulatory patients, healthy patients who were simply in the healthcare setting for diagnostic tests (in at least one case that turned out to be negative), for routine visits (childhood immunizations, dialysis, home care) or had an acute illness and were expected to fully recover.

[10] Forrest, ARW. The Investigation and Prosecution of Health Care Workers Who Systematically Harm Their Patients (unpublished dissertation, University of Wales, 1992.)

4. **Is there reason to be concerned about this phenomenon in the Long Term Care and Homecare settings? Why?**

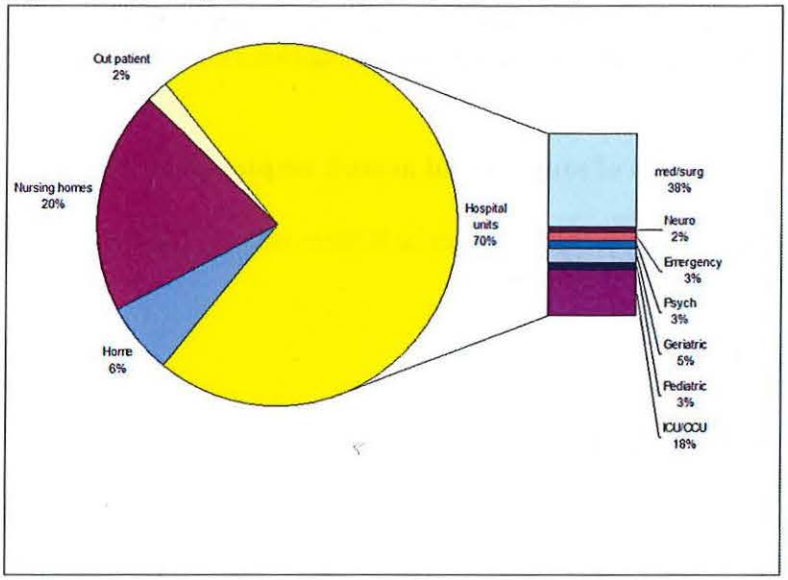
The total number of convicted HCSKs is 90, below is the breakdown of settings in which they worked. Some worked in multiple settings and were associated with suspicious deaths in more than one setting before being caught. Hospitals comprise the majority of settings for HCSKs since 1970. Nursing Homes/Long Term Care make up the next largest number of settings, followed by Home Care.

Figure 2. Settings of Convicted Healthcare Serial Killers



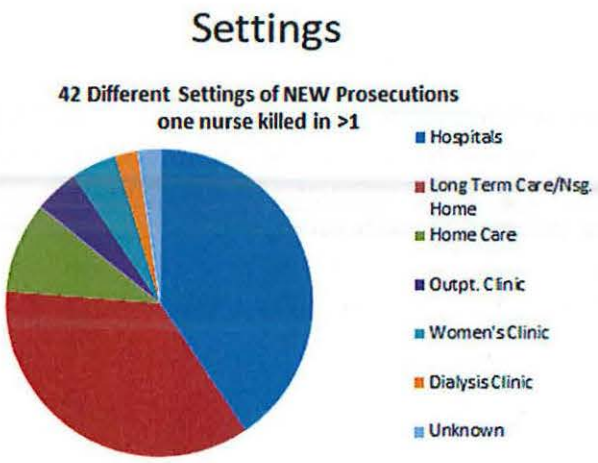
Yes, there is reason to be concerned about this phenomenon in Long Term Care and Homecare. While the data indicate that the majority of prosecutions and convictions have been identified in hospitals and high tech environments, that trend is changing. In 2006, 70% of deaths associated with serial healthcare prosecutions took place in hospitals, 20% took place in nursing homes or LTC and only 6% took place in homecare, see breakdown of 2006 settings for prosecuted HCSKs compared to the 41 new prosecutions of HCSKs below comparing Figure 2 to Figure 3.

Figure 3. Settings of 90 prosecutions in 2006



Since our 2006 study was published, the percentage of new HSKs in Nursing Homes/Long Term Care settings increased from 20% to 36% and Home care increased from 6% to 10% of deaths associated with the newly identified prosecutions of Healthcare providers.

Figure 4. Settings of 41 new prosecutions



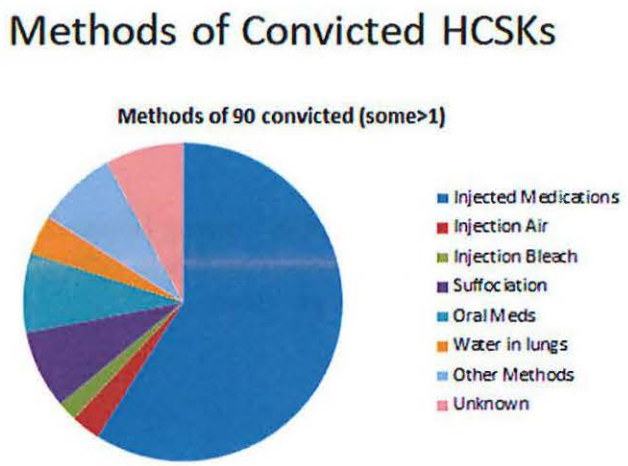
Reasons for concern about potential patient abuse in Long Term Care and Homecare settings include the following; a) There is less oversight and more independence for nursing staff; b) Patients are expected to die in long term care; c) Patients have diminished capacity, dementia,

terminal illnesses and are physically frail; d) Patients in long term care may also be physically aggressive and high fall/injury risks, making restraints, sedation, bruising or injuries more expected; e) Patients in long term care are typically on a variety of medications that could sedate or alter their mental status.

5. What were the most frequent methods of murder and assault employed by HCSKs?

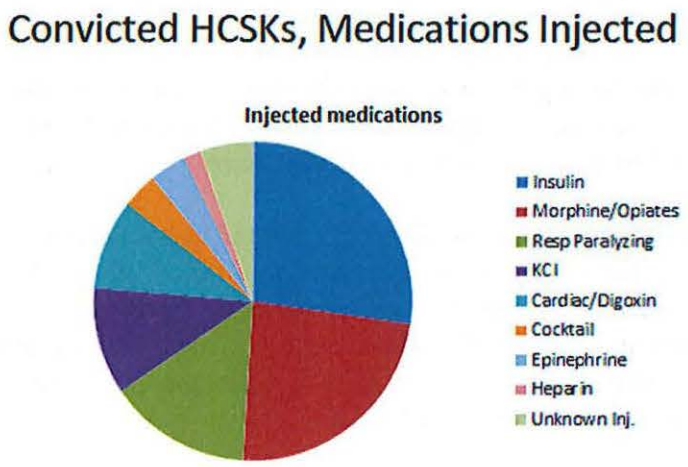
The total number of methods used by the 41 new Healthcare Serial Killers was 45. That is because several used multiple methods to kill their patients.

Figure 5. Methods of Total Convicted HCSKs



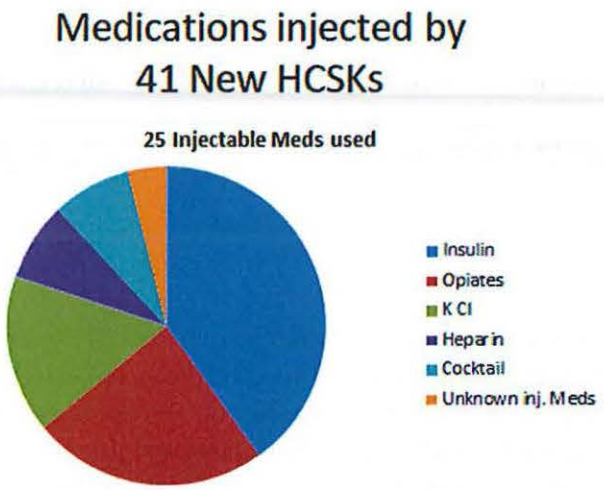
Injection remains the most common method of murder and assault by healthcare providers. In 2006, 52% of prosecutions involved injection. In our updated data which limits the numbers to the methods of 90 convicted killers, the percentage of injection as a form of murder is 70%. However, in this data, we broke it down by injection of medications at 65%, plus injection of non-medication substances, air embolus and bleach as 5%. Suffocation and oral medications are 9% each, followed by unknown methods and the four Austrian nurse's aides who poured water in the lungs of their patients.

Figure 5. Medications Injected by Convicted HCSKs



Insulin is the most used injectable medication by the total number of convicted killers, followed by morphine and other opiates. Several HCSKs used multiple injectable medications, depending on what was available, or as their techniques evolved. Charles Cullen talked at length about how he changed his practice of injectable medications as time went on[11].

Figure 6. Medications Injected in Prosecutions since 2006 study



[11] https://www.ncsbn.org/1229.htm

Insulin went from 13% in 2006, to 40%. This is a significant increase and shows that Insulin is increasingly used by HSKs globally.

Given that 54 out of 90 convicted healthcare providers used injectable medications to murder or assault patients, this indicates that diversion (defined as taking a medication that is intended for a patient, for use other than what was prescribed, by a nurse or other healthcare professional) of injectable medications is significantly correlated with HCSK. Diversion of insulin was the method used in the Elizabeth Wettlaufer case.

Since injectable medications typically come in vials and are dispensed by a pharmacy for a specific patient care unit, or for a specific patient, the data regarding the number of injectable medications used to murder and assault patients indicates that injectable medications were diverted from an intended patient by a nurse or other HCSK. There was no evidence to suggest that any of the convicted killers used their own injectable medications to harm patients. This raises the issue of diversion of medications as a risk factor for HCSKs.

D**iversion of patients' medication by a health care provider does not mean that the provider is a serial killer.** In fact, the vast majority of drug diversion is for personal use. Diversion of patients' medication for personal use by a healthcare provider causes patient harm in at least four ways:

1. A patient who does not receive the prescribed medication is harmed
2. A provider may be impaired as a result of diverting a drug for personal use
3. The diversion of injectable medications for personal use, or for injection in a person who was not prescribed the medication may cause contamination with infectious diseases such as HIV[12], Hepatitis, or others
4. Diversion is theft, patients, or their third party payors, may be paying for medications that are not going to the intended use.

See response to Question #8 for further recommendations regarding medication diversion.

6. **How do HCSKs tend to be detected? Are there particular challenges in the detection of HCSK?**

HCSKs are detected several ways:

1. In several cases hospitals or nursing homes reported suspicious clusters of deaths and cardiopulmonary arrests in specific patient care areas. In five published cases, the Centers for Disease Control investigated suspicious clusters of deaths and identified presence of a specific nurse as the most strongly linked correlation to these epidemics.
2. In several cases patients or their families complained that a specific nurse had injected them or their family member at some point before the patient either died, suffered a cardiac arrest, or another adverse and unexpected adverse event.

[12] A nurse is being prosecuted, plus a class action lawsuit is launched, because she allegedly exposed patients to hepatitis C by stealing drugs and using her own needle to give patients their medication https://www.yahoo.com/lifestyle/hospital-sued-nurse-allegedly-exposed-patients-hepatitis-c-171411119.html

3. Other nurses are often the first to report their suspicions that unexplained, unexpected adverse patient outcomes were associated with presence of a specific nurse.
4. Routine quality assurance data reveal an increase in patient deaths, or adverse patient outcomes.
5. Toxicology results at the time of an adverse patient incident or death reveal presence of toxic amounts of either a prescribed medication, or an un-prescribed medication.

Challenges to detection of HCSKs include the fact that **death is a possible, and often expected, outcome** in hospitals and particularly in long term care. Healthcare settings are not treated as potential crime scenes, thus medical supplies and equipment that could provide important **evidence is not routinely preserved**. Even with toxicology screening post-cardiac arrest, or post-mortem, methods such as injection of air embolus would still go un-detected. Also, even if an autopsy is performed, suffocation might not be detected, cardiac rescue drugs may not be considered alarming, and not all poisons are detected in toxicology screens[13].

Insulin injection poses some unique challenges to detection. Many patients in hospitals and Long Term Care are on Insulin, therefore they have their own supply of this medication, typically in both long acting and short acting forms. Insulin can take hours or days to induce coma or death. The symptoms of hypoglycemia are non-specific and can vary from patient to patient. If detected, it can be reversed with administration of IV Dextrose, which may revive a patient who was given a toxic dose of insulin, without suspicion of wrongdoing. A killer who overdoses a patient on insulin has often been off the premises for several hours or shifts when the patient is adversely affected by the overdose. For diabetic patients on Insulin, it may be considered an expected finding when detected in post-mortem toxicology. However, in spite of the challenges, Insulin is the most used injectable medication used in HCSKs. Insulin was the choice of injection by 15 convicted HCSKs and found in another 4 acquitted/pending investigations, for a total of 19 out of 55 injectable medications in our data.

Long Term Care facilities may not be adequately equipped to conduct routine surveillance that could provide early detection of abnormal patterns of death or adverse patient events. In the case of Orville Majors, the community hospital allowed a killing spree to go undeterred for a year. No one noticed that the average number of deaths per year was 26, but after he was hired, the unit's death rate had increased to over 100 a year. When he was on duty, a patient died every 23 hours, compared to one death every 551 hours when he was not. Unfortunately, the hospital's "Death Review Committee" had not met for 11 of the 12 months of the year of the increased deaths[14].

Hospitals and Long Term Care Facilities should have a uniform understanding of what would be considered a "normal" or "typical" death. Definitions of suspicious death or cardiac arrest are lacking. Routine analysis of patterns of deaths, adverse patient incidents, unexpected patient decline and other data that could alert healthcare agencies of unusual clusters of patient morbidity and mortality may not be consistently performed in long term healthcare settings.

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[13] Sackman, B. When the ICU Becomes a Crime Scene. Crit Care Nursing Quarterly 38(1):30-5 · December 2015
[14] http://www.nydailynews.com/news/national/ind-nurse-allegedly-poisoned-100-vics-360-years-6-kills-article-1.2952676

7. **Having reviewed materials relating to Elizabeth Wettlaufer's crimes, how do the circumstances of her crimes compare to the data surrounding crimes by other HCSKs?**

I reviewed the following materials relating to Elizabeth Wettlaufer's crimes; Agreed Statement of Facts on Guilty Plea; Proceedings before the Honourable Justice B. Thomas on June 26, 2017; Centre for Addiction and Mental Health (CAMH) Discharge Data summary from in-patient hospitalization of EW, transcript of the Commission Counsel interview with EW, video portions of the police interview and a handwritten confession of EW. The following circumstances are similar to data regarding HCSKs.

The **use of Insulin** as the injectable medication that Elizabeth Wettlaufer used is consistent with the most used agent (40%) in cases since 2006. Insulin is a common medication used for patients in hospitals and long term care. Insulin causes hypoglycemia which can present in a variety of non-specific symptoms over a period of time, including death.

The fact that Elizabeth Wettlaufer worked on the **evening/night shift** is consistent with many of the known circumstances in other HCSKs. There are fewer healthcare providers present, fewer family members are present and a single RN is typically in charge on the evening and night shifts.

The number of HCSKs in Nursing Homes and Long Term Care increased since 2006, from 20% to 29%. It may be that computerized medication administration is more prevalent in hospitals than in long term care and home care, thus making it more likely for HSCKs to occur in long term care or home care.

There is **one significant difference** between Elizabeth Wettlaufer and the other HCSKs. The fact that **she turned herself in** before she was assigned to work as a registered nurse with children is completely unprecedented. While some of the convicted nurses confessed after they were arrested [15], the vast majority have maintained their innocence. Elizabeth confessed which led to her being arrested for murder and assault and potentially prevented further assaults and murders. She then pleaded guilty and was sentenced.

8. **To the best of your knowledge, have any steps been taken in the United States or elsewhere that have assisted in the prevention or detection of HCSKs? Please describe.**

There have been several systemic responses designed to improve patient safety overall, as well as some improvements in hiring and reporting practices implemented specifically in response to HSCKs. Whether these steps have assisted in the prevention or detection of HCSKs is speculative, however, I have included evidence of improved patient outcomes, data regarding the

[15] Charles Cullen (USA) confessed to 40 murders in 9 different healthcare settings. Niels Hoegel (Germany) confessed to an additional 97 murders once he was in prison. Stephan Letter (Germany confessed to administering lethal injections because he felt sorry for his patients and he was "liberating their souls". however at least 6 were in no danger of dying and a few had been lethally injected shortly after admission to the hospital, before being fully examined.

reduction of new HCSKs in the USA since 1990, as well as recommended hiring practices and avenues for reporting dangerous practitioners designed to prevent and detect both accidental and intentional acts of harm toward patients.

Measures to Improve Patient Safety Overall

While the following measures have been implemented to improve patient outcomes in general, there are a variety of safeguards and practices that should also prevent patient harm due to intentional acts. The international focus on improving quality and accountability in healthcare described below has the potential to deter nurses and other healthcare providers from engaging in criminal acts.

Research on Nursing to Improve Patient Safety, Satisfaction and Outcomes
Linda Aiken conducts research on the health care workforce and quality of health care in the U.S. and globally. She co-directs RN4CAST, a European Union funded study of nurse workforce and quality of care in 12 European countries, China, and South Africa and directs RN4Cast-United States, a study of the outcomes of nursing care in hospitals, nursing homes, home care, and office-based practices. Her funded research demonstrates the relationships between nursing staffing ratios and education on patient outcomes. Her studies conclude that patient outcomes overall improve when nurses are better educated, e.g. with a Baccalaureate Degree or higher, and when staffing ratios are higher[16] [17]. "Every one additional patient added to a nurses' workload results in a 7% increase in hospital mortality" [18]. Furthermore, nurses' satisfaction in twelve countries confirms that features of the hospital work environment (such as better staffing ratios of patients to nurses, nurse involvement in decision making, and positive doctor-nurse relations) are associated with improved patient outcomes, including reduced mortality and increased patient satisfaction. Deficits in hospital care quality were common in all countries. Improvement of hospital work environments might be a relatively low cost strategy to improve safety and quality in hospital care and to increase patient satisfaction [19].

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[16]Aiken, L.H., Sermeus, W., Van den Heede, K., Sloane, D.M., Busse, R., McKee, M., Bruyneel, L., Rafferty, A.M., Griffiths, P., Moreno-Casbas, M.T., Tishelman, C., Scott, A., Brzostek, T., Kinnunen, J., Schwendimann, R., Heinen, M., Zikos, D., Sjetne, I.S., Smith, H.L., and Kutney-Lee, A. (2012). Patient safety, satisfaction, and quality of hospital care: Cross-sectional surveys of nurses and patients in 12 countries in Europe and the United States. BMJ 2012;344:e1717.

[17] Aiken, L.H., Sloane, D.M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse., R., Diomidous, M,, Kinnunen, J., Kozka, M., Lesaffre, E., McHugh, M., Moreno-Casbas, M.T., Rafferty, A.M., Schwendimann, R., Tishelman, C., van Achterberg, T., and Sermeus, W. (2014). Association of nurse staffing and education with hospital mortality in 9 European countries. The Lancet (383), 1824-1830.

[18] Linda Aiken, et al., "Supplemental Nurse Staffing in Hospitals and Quality of Care," JONA, July/August 2007. http://www.amnhealthcare.com/PDF/Use_of_Supplemental_Nurses_AMN_Webcast.pdf.

[19] In the face of sustained increasing pressure on health expenditures from ageing populations, rising public expectations, and the introduction of new technology, European countries have been implementing a wide range of cost containment strategies. Although expenditures on health, expressed as a percentage of gross domestic product, have been rising in European countries, the rate of increase in Europe has been much slower than in the United States. The Netherlands, the highest spending European country in 2009, spends only 12.0% of their gross domestic product on health, compared with 17.4% spent in the US. In many European countries, this percentage is much lower, for example, Finland at 9.2% and the United Kingdom at 9.8%.See footnote 10.

Reporting Criminal Events

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has maintained a sentinel events database since 1995. Sentinel events are defined as: An unexpected occurrence involving death or serious physical or psychological injury, or the risk of death or serious injury[20]. The term is not synonymous with medical error, meaning that many medication and other errors in healthcare do not result in any patient harm, thus not considered a sentinel event. Accredited healthcare organizations are required to define a sentinel event in a way consistent with the Commission's definition and to set a policy for identifying, reporting, and managing such an event.

The JCAHO database includes 2,552 reports of sentinel events affecting 2,667 patients. Seventy-five percent of these events resulted in a patient's death. There is a JCAHO category that would include HCSKs, titled Criminal Events. These include:

1. Any instance of care ordered by or provided by someone impersonating a physician, nurse, pharmacist, or other licensed health care provider
2. Abduction of a patient of any age
3. Sexual assault on a patient within or on the grounds of the health care facility
4. Death or significant injury of a patient or staff member resulting from a physical assault (i.e., battery) that occurs within or on the grounds of the health care facility.

Below are the most often reported sentinel events and the total for each since 2015[21]. Criminal Events account for 4.6% in 2017 compared to 6.2% in 2014, however, this is a minimal change and the numbers are not large enough to indicate that measures to reduce criminal events are necessarily effective.

Table 3. Numbers of Sentinel Events, 2014-2017

Type of Sentinel Event	2014	2015	2016	2017
Anesthesia-Related Event	6	7	6	4
Criminal Event	47	47	33	37
Delay In Treatment	79	83	62	66
Dialysis-Related Event	2	0	7	1
Elopement	6	7	9	12
Fall	93	95	102	114
Fire	10	26	16	16
Infant Abduction	0	3	2	0
Infant Discharge to Wrong Family	0	0	1	0
Infection-Related Event	12	13	7	3
Inpatient Drug Overdose	8	13	13	8
Maternal Death	11	6	7	5
Med Equipment-Related	9	14	10	9
Medication Error	20	47	35	32
Op/Post-op Complication	53	82	50	19
Other Unanticipated Event**	73	58	51	60
Perinatal Death/Injury	35	43	27	17
Radiation Overdose	4	4	4	2
Restraint Related Event	2	7	7	4
Self-Inflicted Injury	5	21	17	18
Severe Maternal Morbidity	0	0	10	15
Severe Neonatal Hyperbilirubinemia	0	2	1	1
Suicide	84	98	90	89
Transfer-Related Event	2	1	2	0

[20] https://www.jointcommission.org/assets/1/6/CAMH_2012_Update2_24_SE.pdf
[21] https://www.jointcommission.org/assets/1/18/Summary_4Q_2017.pdf

Transfusion Error	7	9	5	5
Unassigned***	3	0	0	54
Unintended Retention of a Foreign Body	116	123	126	116
Utility System Failure	0	1	1	0
Ventilator Death	3	3	2	3
Wrong-patient, wrong-site, wrong-procedure	73	120	121	95
Total Incidents Reviewed	763	934	824	805

The location of reported sentinel events since 2005 has been predominantly in hospitals (67%), with 2% in Home Care and only 1% in Long Term Care.

The Joint Commission does not provide specific guidance for preventing HCSKs but when a serial killer in a healthcare setting is reported, it would fall under the "Criminal Events" category. Measures taken by hospitals to reduce Criminal Acts include routine Criminal Background Checks and more recently, drug screening on nursing personnel prior to hiring in a healthcare setting. While Criminal Background Checks may have reduced sexual assault, theft, and opiate diversion, there is little empirical evidence that evidence to support the efficacy of criminal background checks on preventing HCSKs[22]. Only one of the prosecuted HCSKs in our 2006 study had a criminal background prior to being arrested for murder in healthcare. We did note that falsifying credentials was more commonly a factor among convicted HCSKs.

Other measures to reduce Criminal Events include placing security guards at key locations, e.g. entrances and Emergency Rooms, installing security cameras and implementing video monitoring in a variety of patient care areas as well as on the grounds, parking areas and entrances. Hospitals are also encouraged to establish and maintain relationships with law enforcement and ensure a committee structure that engages key stakeholders to preventing crime[23]. These measures may have a deterrent effect on HCKSs, as discussed in my response to question # 8.

Medication Error Reduction

Since the 1999 Institute of Medicine report: "To Err is Human"[24], found that medical error accounted for as many as 44,000 to 98,000 deaths annually in the United States, there has been movement to a "Patient Safety Culture" which refers to the beliefs, values, and norms shared by health care practitioners and other staff throughout the organization that influence their actions and behaviors. It can be measured by determining what is rewarded, supported, expected, and accepted in an organization as it relates to patient safety.

Through its Surveys on Patient Safety Culture (SOPS™) Program, Agency for Healthcare Research and Quality in the USA develops and maintains surveys, toolkits, and databases for hospitals, medical offices, nursing homes, community pharmacies, and ambulatory surgery centers; provides technical assistance and education; and promotes the use of the surveys for patient safety culture improvement.

Organizations can use these survey assessment tools to:
•Raise staff awareness about patient safety.

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[22] Kizer, K., Yorker, B. Health Care Serial Murder: A Patient Safety Orphan. *The Joint Commission Journal on Quality and Patient Safety*.36(4):186-191. April, 2010

[23] https://www.jointcommission.org/assets/1/23/Quick_Safety_Issue_Five_Aug_2014_FINAL.pdf

[24] Institute of Medicine. To Err is Human: Building a Safer Health System, November, 1999.

•Diagnose and assess the current status of patient safety culture.
•Identify strengths and areas for patient safety culture improvement.
•Examine trends in patient safety culture change over time.
•Evaluate the cultural impact of patient safety initiatives and interventions.
•Conduct internal and external comparisons.

Changes that Prevent Medication Errors

Viewing errors as systems or process issues—rather than individual failures—has led to what is called "Just Culture" in Nursing. A movement from shame and blame as a response to medication errors, to a model of transparency and encouraging root cause analysis. As part of these reviews of the entire drug administration process, the literature offers evidence that patient safety OVERALL has improved.

Since then many safeguards for medication administration have been put in place, not only in the USA, but in Britain as well[25] Bar Code administration through electronic medical records (eMAR) has substantially reduced the rate of errors in order transcription and in medication administration as well as potential adverse drug events. The New England Journal of Medicine published articles concluding eMAR is an important intervention to improve medication safety" when linked to Bar Code Administration. [26] "Increasingly hospitals are recognizing the value of interoperability between electronic health records and automated dispensing cabinets, or ADCs such as Pyxis, Omnicell, Pandora and others. In addition to eliminating redundancies during the medication ordering process, linking the ADCs to eMARs helps to reduce medication errors at the point-of-care"[27].

A survey conducted by the American Society for Health-System Pharmacists identified additional changes that can significantly decrease medication errors. These include decreasing floor stock, using unit dose dispensing, having two pharmacists check orders before dispensing drugs, using automated syringe-filling devices in a laminar-airflow hood for parenteral nutrition and having a pharmacist approve all drug orders. And when clinical pharmacists accompany other healthcare professionals on patient rounds, communication improves and medication errors drop.

Anderson et al. [28] conducted research on medication errors specifically in Nursing Homes and found that nurses employed in nursing homes scored significantly lower than the national sample of nurses on the medication-reporting and patient safety measures. They recommended team approaches in nursing homes to increase timely reporting of medication errors, increase open communication while reducing fear of liability and disciplinary action.

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[25] Institute for Healthcare Improvement. Federico, F. 15 Years after To Err Is Human: The Status of Patient Safety in the US and the UK. Sunday, December 6, 2015 http://www.ihi.org/communities/blogs/15-years-after-to-err-is-human-the-status-of-patient-safety-in-the-us-and-the-uk

[26] Poon EJ, Keohane CA, Yoon CS et al. Effect of Bar-Code Technology on the Safety of Medication Administration. N Engl J Med 2010; 362:1698-1707. See also responses to the Editor.

[27] http://www.healthcareitnews.com/news/linking-ehrs-medication-cabinets-improved-safety

[28] Anderson T, Silviera C, Woodland R, Hanler S, Hutton M. Promoting and Regulating Safe Medications Administration in Nursing Homes. J Nurs Regulation 2011; 2(1):56-61.

While these measures are not specifically targeted to prevent HCSKs, the overall effect has certainly made it much more difficult than it was in the 1980's to acquire injectable medications and administer more than the therapeutic amount to unintended patients. In the United States and other jurisdictions, the many safeguards that are increasingly being adopted are making what was previously fairly easy to get away with, much more difficult.

Measures to improve patient safety in response to HCSKs

Our 2010 article in the *Joint Commission Journal on Quality and Patient Safety* (attached in **Tab H**) suggest the following strategies be taken to understand and prevent Health Care Serial Murder:

1. Healthcare organizations, accrediting bodies and licensing agencies should do more to increase awareness of the phenomenon

2. A US federal agency should collect and analyze data about these occurrences and maintain a clearinghouse of information on the subject.

3. Meaningful information regarding a previous employee should be communicated to prospective employers. After Charles Cullen confessed to murdering patients in nine different facilities, Pennsylvania and New Jersey enacted laws to protect hospitals from lawsuits for providing honest job evaluations and work histories. Immunity, or Good Samaritan type legislation, for employers who do share information about increased adverse incidents associated with the presence of a particular healthcare worker, along with reasons for termination, would certainly improve transparent communication and references regarding patient safety concerns.

4. There should be protection for nursing staff who express concerns about a particular nurse or healthcare provider.

5. Healthcare agencies and employers should develop "Consensus Guidelines" for managing suspicious situations (clusters of adverse patient incidents or complaints regarding particular healthcare employees by patients or staff) in a way that maintains employee privacy and civil rights, but at the same time examines circumstances critically to include the possibility of intentional harm by an employee. An independent entity such as the Institute of Medicine or Academy of Sciences should review current peer review, licensure, adverse event reporting and the National Practitioner Data Bank information for timely information regarding adverse events associated with a particular healthcare provider.

Such Guidelines should be developed by an agency whose mission is to identify evidence-based safe practices, and should include:

a. Circumstances that should prompt consideration of intentional harm
b. Thresholds for reporting adverse patient incidents to public health, licensing or law enforcement
c. Procedures for collecting potential evidence

Hiring and Employment Practices to Protect Patients from Criminal Behavior by Nurses
Since our 2010 article, and in the wake of several high profile cases, nursing leaders have made several recommendations to prevent "harmful staff" from being hired, re-employed or able to easily attain new employment in healthcare. Examples are:

1. The American Organization of Nurse Executives (AONE) recommends an Applicant Reference form that includes a waiver for information to be provided by former employers including formal disciplinary actions, incidents involving abuse, neglect or violence toward patients, and reason for separation from employment[29]. See sample form and entire article in **Tab I.**

2. The Nursing and Midwifery Council in the United Kingdom has strengthened its process for registering applicants from countries outside the European economic area, in the wake of the highly publicized prosecution of a foreign nurse at Stepping Hill hospital for Insulin poisoning by tampering with IV bags. There was evidence suggesting the nurse falsified his credentials and may have paid someone to sit for the exam in his home country. The British government supported more than £4m of additional funding for strengthening hiring and licensure procedures in addition to improvements already implemented, such as a pre-employment test of clinical competence, a more robust system of face-to-face identity checks and advanced passport scanning technology to verify identity documents.

3. An article on Canadian Nursing Supervisors' Perceptions of Monitoring Discipline Orders conducted a cross-sectional survey of 2,928 nurses in leadership roles in Ontario (with a 56% response rate) found that while 90% believed remediation was necessary to help nurses return to safe practice, only 18% indicated they would hire a nurse with a discipline order. The researchers recommended training and found that nurse leaders felt they needed additional resources for how to supervise nurses who were under discipline orders. They suggested stronger collaboration between regulators and employers in the discipline monitoring process[30]. Entire article is in **Tab J**.

Reporting Systems for Dangerous Practitioners
Unfortunately, our data revealed several cases in which nurses who spoke up to hospital administration about their observations of nurses who were later convicted of serial murder, were harassed, fired, or otherwise silenced and disciplined in a retaliatory way for expressing their concerns. On the other hand, several successful prosecutions hinged on nurses who reported their suspicions about a particular nursing colleague to superiors, administrators or law enforcement and were taken seriously.

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[29] AONE Guiding Principles to Protect Patients from Reckless Behavior by Registered Nurses, 2011 http://www.aone.org/resources/reckless-behavior.pdf
[30] Ismail, F. Clarke, SP. Canadian Nursing Supervisors' Perceptions of Monitoring Discipline Orders: Opportunities for Regulator-Employer Collaboration. J of Nurs Regulation. 6(4):68-72. January 2016.

Because there is a genuine fear of retaliation, the literature supports the efficacy of Anonymous Reporting Systems in stopping harmful practitioners. Federal laws protect whistleblowers from retaliation. The Department of Health and Human Services, Office of Inspector General, recognizes that whistleblower disclosures play a critical role in rooting out abuse and protect public health and safety. They have established an online reporting system and a Whistleblower Ombudsman to educate employees about prohibitions on retaliation for whistleblowing, as well as employees' rights and remedies if anyone retaliates against them for making a protected disclosure.

Measures to Detect Medication Diversion

Given that 54 out of 90 convicted healthcare providers used injectable medications from the workplace to murder or assault patients, and that Elizabeth Wettlaufer admitted to diversion of insulin, this indicates that diversion of injectable medications is significantly correlated with HCSK.

Systems that routinely print out "Anomalous Usage Reports" have proven useful in early detection of drug diversion on the part of a specific nurse[31] [32]. Jerry Siegel, a pharmacist at the Ohio State University Medical Center describes "Code N" a Multidisciplinary Approach to Proactive Drug Diversion Prevention that has a variety of "best practices" and tools for prevention of drug diversion. [33]

Routine Surveillance

Nursing leaders recommend that all healthcare facilities maintain routine data collection following deaths and adverse incidents. The data should include the time and date, type of patient, medications used, toxicology results, body systems involved (e.g. cardiovascular, neuro, gastrointestinal, endocrine, etc.), co-morbidities and whether the death or adverse event was unexpected. Quality Assurance Committees should review routine data and be alert to any trends that are outside what is typical for that patient care area[34].

In at least six of the early cases of nurses charged with murder, routine epidemiologic surveillance detected presence of an unusual cluster of patient deaths (See footnotes 1-6). In the case of Orville Lynn Majors, the lack of such surveillance may have contributed to a prolonged epidemic of patient deaths as the hospital "Death Review Committee" had not met for the 11 months prior to his arrest after nursing colleagues reported their alarm at the increased number of deaths when he was present.

Even though patients in Long Term Care are often expected to live the duration of their lives in that setting, this does not mean all deaths in LTC are expected. Nurses are educated regarding what constitutes a "good death". Particularly in Long Term Care settings, it is imperative that nursing staff understand Palliative Care, the signs of pending demise and provide comfort care, the opportunity for family to be present, and facilitate the easiest possible process of dying. Checklists following death in LTC facilities should include variables that allow for

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[31] https://transform-healthcare.com/2015/06/09/using-analytics-to-detect-diversion/
[32] https://rxdiversion.com/detecting-and-responding-to-drug-diversion/
[33] https://www.mnhospitals.org/Portals/0/Documents/ptsafety/diversion/code-n.pdf
[34] https://www.ahcmedia.com/articles/7945-killer-practitioners-what-can-you-

discriminating between true unexpected deaths and those that are expected and thoughtfully attended.

The presence of routine video surveillance has been adopted to decrease patient falls, prevent violent acts and enhance security in a variety of patient care areas. Video surveillance may also aid in the detection of HCSKs and potentially deter them. The recent arrest of a nurse in Texas illustrates this point. After pockets of air were found on autopsy of several patients who suffered stroke like events and death, video footage showed a specific nurse seen entering patients' rooms shortly before they suffered "unexpected medical emergencies"[35].

In conclusion, while the data presented here is limited to only 90 convicted HCSKs since 1970, the phenomenon of HCSK continues to be detected. There have been many measures to improve patient safety overall over the past three decades that may be causing the number of new HSCKs in the USA to have decreased to less than 10% of the convictions worldwide since 2010. A 2014 article quotes Dr. E. Khin Khin of George Washington University when she spoke at a meeting of the American Academy of Psychiatry and the Law: "*One reason the rates of healthcare serial murders are rising internationally, but not in the U.S., is electronic medical records (EMR)... We know that in America, with the implementation of the EMR system, that really decreases the potential for these incidents. You can't just take out medications and start injecting someone; everyone's accountable because of EMR. But in most parts of world, they don't even have EMR. At least in the [United] States, because of incidents in 1990s and 2000s, we've really beefed up on the credentialing system, and institutions have started to communicate with each other better. People are not shedding enough light on the international phenomenon, and the global community has a little bit to catch up on in implementing guidelines and regulatory measures.*"[36]

That said, not all HCSKs can be prevented. The recent cases in Texas illustrate that nurses were able to bypass all the EMR and medication administration tracking systems in place by injecting non-medication toxins such as bleach and air embolus. However, there is evidence to indicate that overall improvements in patient safety, including support for nursing vigilance regarding the potential for intentional acts, medication dispensing systems, as well as routine tracking of adverse events and unexpected deterioration of patients' condition, are all recommended measures that can contribute to the deterrence, reduction, and early detection of HSCKs.

Respectfully Submitted,

Beatrice Crofts Yorker, JD, RN, MS, FAAN

Signature: Beatrice Crofts Yorker Date: 5/28/2018

[35] https://wtop.com/national/2018/04/warrant-former-texas-nurse-a-suspect-in-2-patients-deaths/
[36] https://www.medpagetoday.com/psychiatry/generalpsychiatry/48281

Public Inquiry into the Safety and Security of Residents in the Long-Term Care Homes System

Commission d'enquête publique sur la sécurité des résidents des foyers de soins de longue durée

April 20, 2018

Professor Beatrice Crofts Yorker
1485 Linda Vista Avenue
Pasadena, CA
91103

Dear Professor Crofts Yorker:

Thank you for coming to Toronto and for meeting with members of our counsel team. We look forward to working with you.

As agreed, you are to prepare a report and to participate as an expert witness in the Inquiry's public hearings. We anticipate at this point that you will be required to attend at the hearing for a maximum of two days probably in mid to late August. We hope to be able to provide you with more precise dates shortly.

Set out below are the questions which we would like you to address in your report:

1. Based on your review of the data, as outlined in your papers entitled [insert 2006 and 2010 article names] and any updated data, is there a phenomenon of health care serial killers?

2. What is the extent of the phenomenon worldwide?

3. Are any particular patient groups particularly vulnerable to the phenomenon? Which groups, and why?

4. Is there reason to be concerned about this phenomenon in the LTC and homecare settings? Why?

5. What were the most frequent methods of murder and assault employed by HCSKs?

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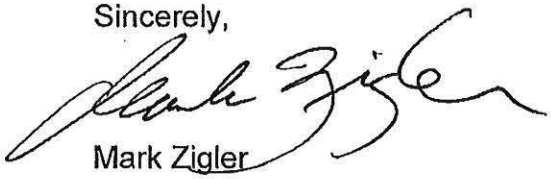
6. How do HCSKs tend to be detected? Are there particular challenges in the detection of HCSK?

7. Having reviewed materials relating to Elizabeth Wettlaufer's crimes, how do the circumstances of her crimes compare to the circumstances surrounding crimes by other HCSKs?

8. To the best of your knowledge, have any steps been taken in the United States or elsewhere that have assisted in the prevention or detection of HCSKs? Please describe.

We would appreciate receiving a report by not later than May 15th but wish to discuss the contents of the report with you prior to its delivery. Thank you again for agreeing to act as an expert for the Inquiry. If you have any questions, or wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,



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B.S. INDIANA UNIVERSITY. B.S. degree in Nursing, 1975.

LICENSURE: Licensed as a Registered Nurse in the State of California,1975-78, and 2001- present. Licensed as a Registered Nurse in the State of Georgia, 1978-2002.

Licensed to practice Law in the State of Georgia, 1989-2002.

EMPLOYMENT:

PROFESSOR	CALIFORNIA STATE UNIVERSITY LOS ANGELES, Professor Emerita of Nursing, Criminal Justice and Criminalistics, 2016-present.
DEAN & PROFESSOR	COLLEGE OF HEALTH AND HUMAN SERVICES, 2005-2015 CALIFORNIA STATE UNIVERSITY, Professor of Nursing and Criminal Justice & Criminalistics, 2005-2015.
DIRECTOR & PROFESSOR	SAN FRANCISCO STATE UNIVERSITY, School of Nursing 2001 to 2005.
STAFF NURSE	SAN FRANCISCO GENERAL HOSPITAL, Department of Psychiatry, part-time In-Patient and Psychiatric Emergency Services, 2002-2005.
PROFESSOR	GEORGIA STATE UNIVERSITY, School of Nursing, 1999 to 2001.
ASSOCIATE PROVOST	GEORGIA STATE UNIVERSITY,Associate Provost for Faculty Relations 1994 to 1998.
ASSOCIATE PROFESSOR	MOREHOUSE SCHOOL OF MEDICINE, Voluntary Faculty Department of Pediatrics, 1997-2001.
DEPARTMENT CHAIR	GEORGIA STATE UNIVERSITY, Department of Psychiatric Mental Health Nursing, 1987-1994.

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CONSULTATION/ LIAISON	GRADY MEMORIAL HOSPITAL, Coordinator of Child and Adolescent Psychiatric Consultation, Liaison Services, 1985. Functioned as a part-time Clinical Specialist in Child Mental Health Nursing, 1983-1985.
ADMINISTRATOR	GEORGIA MENTAL HEALTH INSTITUTE, Administrator in Charge. Functioned as part-time evening administrator for State psychiatric facility, 1983-1985.
EVALUATOR	NEW YORK REGENTS COLLEGE DEGREE PROGRAM, Southern Performance Assessment Center, evaluated clinical performance examinations in nursing one weekend per month, 1981 to 1991.
DIRECTOR OF NURSING	EMORY UNIVERSITY HEALTH SERVICES, Supervised a staff of 24 Nurses and Nurse Practitioners. Provided direct care to student and faculty clients. Performed physical assessment and crisis intervention, 1981-1983.
STAFF NURSE	PROFESSIONAL REGISTRY FOR THE NORTHSIDE, INC. Provided float pool staff nursing on a variety of medical/surgical floors at Emory Hospital and Rehabilitation Center, part-time, 1978-1981.
INSTRUCTOR	EMORY UNIVERSITY, Nell Hodgson Woodruff School of Nursing. Undergraduate and Graduate faculty member, 1978-1981.
REGISTERED NURSE	SAINT MARY'S HOSPITAL, San Francisco. Child-Psychiatric Unit, 1977-1978.
	PRESBYTERIAN HOSPITAL, San Francisco. Emergency Psychiatric Unit, 1976-1977.
	LANGLEY PORTER NEUROPSYCHIATRIC INSTITUTE, San Francisco. In-patient treatment and research unit, 1975-1976.
GRADUATE NURSE	INDIANA UNIVERSITY HOSPITAL, Indianapolis, IN. Medical/psychiatric unit, 1975.
STUDENT NURSE	QUINCO BEHAVIORAL HEALTH SYSTEM, Columbus, IN. In-patient unit, Summers of 1973 & 1974

Articles in Refereed Journals:

Yorker, B., Alexander, R. Sanders, M. (2018) Munchausen by Proxy: Abuse by Pediatric Condition Falsification, Caregiver-Fabricated Illness in a Child, or Medical Child Abuse due to Factitious Disorder Imposed on Another. Introduction to the Special Issue of the *APSAC Advisor*. 30(1):4-7.

Ersenio-Jenssen, D., Alexander, R., Feldman, K., Yorker, B. (2018) The Influence of Electronic and Internet Advances on Munchausen by Proxy. *APSAC Advisor*. 30(1):83-91.

Johnson, DJ; Matthies, LK; Roberts, KA; Yorker, BC. (2010) Isolation and Individualization of Conceptus and Maternal Tissues from Abortions and Placentas for Parentage Testing in Cases of Rape and Abandoned Newborns. *Journal of Forensic Science.* 55(6):1430-1436.

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Yeh MY; Sung SC; Yorker BC; Sun CC; Kuo YL (2008) Predictors of adherence to an antidepressant medication regimen among patients diagnosed with depression in Taiwan. *Issues in Mental Health Nursing* 29(7): 701-17

Bursch B; Schreier HA; Ayoub CC; Libow JA; Sanders MJ; Yorker, BC. (2008) Further thoughts on "Beyond Munchausen by proxy: identification and treatment of child abuse in a medical setting". *Pediatrics* 121(2): 444-5; author reply 445

Yorker, B.C., Kizer, K.W., Forrest, A.R.W., Lampe, P., Lannan, J., Russell, D. (2006) Serial murder by healthcare professionals. *Journal of Forensic Science*, 51:6 1362-1372.

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Yorker, B.C., Kelley, S.J. (2003) Case law regarding nurses as expert witnesses in child abuse. *Issues in Mental Health Nursing* 24:639-645.

Ayoub, C., Alexander, R., Beck, D., Bursch, B., Feldman, K., Libow, J., Sanders, M., Schreier, H., Yorker, B. (2002) Position paper: Definitional issues in Munchausen by Proxy. *Child Maltreatment* 7:105-111.

Kelley, S.J., Yorker, B.C., Whitley, D., Sipe, T.A. (2001)A multimodal intervention for grandparents raising grandchildren: Results of an exploratory study. *Child Welfare* LXXX(1):27-50.

Kelley, S.J., Whitley, D., Sipe, T.A., Yorker, B.C., (2000) Psychological distress in Grandmother kinship care providers: The role of resources, social support, and physical health. *Child Abuse and Neglect*. 24(3):311-321.

Whitley, D. M., White, K. R., Kelley, S. J., Yorker, B. (1999) Strengths-based case management: The application to grandparents raising grandchildren. *Families in Society.* 80(2):110-119.

Goldman, L. H. & Yorker, B. (1999) Mommie Dearest? A prosecutor's guide to Munchausen Syndrome by Proxy. *Criminal Justice*. 13(4):26-33.

Yorker, B. C. (1998) Liability associated with factitious disorders. *Journal of Nursing Law*. 5(4):7-22.

Yorker, B.C., Kelley, S., Whitley, D. Lewis, A., Magis, J. Bergeron A., & Napier, C. (1998) Custodial relationships of grandparents raising grandchildren: Results of a multi disciplinary intervention study. *Juvenile and Family Court Journal*. 49(2):15-25.

Yorker, B.C. (1997) Institutional liability for children who molest other children. *American Professional Society on the Abuse of Children- Advisor* 10(4):9-15.

Kelley, S.J. & Yorker, B.C. (1997)"To Grandmother's house we go...and stay": Children raised in intergenerational families, *Journal of Gerontological Nursing*. 23(9):12-20.

Kelley, S.J., Yorker, B. (1997) The role of non-physician health care providers in the physical assessment and diagnosis of suspected child maltreatment: Results of a national survey. *Child Maltreatment*. 2(4):331-340.

Wilson, A. & Yorker, B. (1997) Fears of medical events among school age children with emotional disorders, parents, and health care providers. *Issues in Mental Health Nursing*. 18:57-71.

Jackson, C., Yorker, B., Mitchem, P. (1996) Teaching cultural diversity in a virtual classroom. *Journal of Child and Adolescent Psychiatric Mental Health Nursing*.9(4):40-42.

King, G. & Yorker, B. (1996). Case studies of ritualistic child abuse. *Journal of Child and Adolescent Psychiatric Mental Health nursing*. 9 (2):18-26.

Yorker, B.C. (1995) Covert video surveillance of Munchausen Syndrome by Proxy: The exigent circumstances exception. Health Matrix: Journal of Law - Medicine Case Western Reserve University Law Review. 5(2): 325-346

Yorker, B. (1995) Liability issues for nurses who work with psychiatric mental health patients. Journal of Nursing Law. 2(4):7-20.

Yorker, B. C. (1994). Munchausen syndrome by proxy as a form of family violence. Family Violence & Sexual Assault Bulletin. 10(3) 34-39.

Yorker, B. (1994). Providing testimony for a legal deposition. AAOHN Journal, (American Association of Occupational Health Nurses) 42(12): 601-609.

Yorker, B. (1994). An analysis of murder charges against nurses. Journal of Nursing Law 1(3): 35-46.

Yorker, B. (1994). An overview of Worker's Compensation Law. AAOHN Journal, 42(9): 420-424.

Farkas, G. & Yorker, B. (1993). Case studies using bibliotherapy with children in a homeless shelter. Issues in Mental Health Nursing, 14(4), 337-347.

Yorker, B. (1993). Occupational safety and health reform: An interview with Patrick Tyson. AAOHN Journal, 41(8), 396-401.

McRae, J. & Yorker, B. (1993). Update on the Americans with Disabilities Act for occupational health nurses. AAOHN Journal, 41(5), 250-257.

Yorker, B. & Kahan, B. (1991). The Munchausen syndrome by proxy variant of child abuse in the family courts. Journal of Juvenile and Family Court Judges, 42(3), 51-58.

Rayburn, S., & Yorker, B. (1991). Maternal rights in the workplace. AAOHN Journal, 39(11).

Kahan, B. & Yorker, B. (1991). Munchausen syndrome by proxy: Clinical review and legal issues. Behavioral Sciences and the Law, 9(3), 73-83.

Yorker, B. (1989). Scope of practice: Case law. AAOHN Journal 37(2), 80-81.

Yorker, B. & Kahan, B. (1990). Munchausen syndrome by proxy as a form of child abuse. Archives of Psychiatric Nursing, 4(5), 313-318.

Yorker, B. (1990). Legal issues of advanced nursing practice. Journal of Pediatric Oncology Nursing, 7(2), 72.

Kahan, B. & Yorker, B. (1990). Munchausen syndrome by proxy. Journal of School Health, 60(3), 108-110.

Warren, C. & Yorker, B. (1989). Coping with cutbacks in psychiatric nursing education. Journal of Child and Adolescent Psychiatric Mental Health Nursing 2(4), 163-165.

Yorker, B.(1989).Informed consent. Journal of Neuroscience Nursing, 21(2):130- 132.
Chally, P. & Yorker, B. (1989). Legal parameters of nursing practice. Journal of Neuroscience Nursing, 21(8), 258-260.

Yorker, B. (1988). AIDS testing: A legal perspective on testing in the workplace. AAOHN Journal, 36(5), 231-232.

Yorker, B. (1988). The prosecution of child sexual abuse cases: Legal issues related to child advocacy. Journal of Child and Adolescent Psychiatric Mental Health Nursing, 1(2), 50-57.

Yorker, B. (1988). The nurse's use of restraint with a neurologically impaired patient. Journal of Neuroscience Nursing 20(6), 390-392.

Yorker, B. (1988). Nurses accused of murder. American Journal of Nursing, 88(10), 1327-1332.
Yorker, B. (1988). Confidentiality - An ethical dilemma: Balancing the "duty to warn" against the right to privacy. AAOHN Journal, 36(8), 346-347.

Yorker, B. (1988). Providing testimony: Acting as a witness in legal proceedings. AAOHN Journal, 36(11), 479-482.

Chapters in edited Books: Yorker, B.C. (2005) Serial Murder in Hospitals. Chapter in: Lynch, V., Editor Forensic Nursing: Essentials for Career Development and Clinical Practice. Elsevier Publishing, Philadelphia, PA.

Laben, J. K. & Yorker, B.C. (1997) Legal issues in advanced practice mental health nursing. In: Burgess, A. W. Advanced Practice in Psychiatric Nursing. Stamford, CT: Appleton & Lange.

Yorker, B.C. (1996). Hospital epidemics of Factitious Disorder by Proxy. In: Feldman, M. & Eisendrath, S. The Spectrum of Factitious Disorders. Washington, DC: American Psychiatric Press, Inc.

Yorker, B.C. (1996). Legal issues of factitious disorder by proxy. In: Feldman, M. & Eisendrath, S. The Spectrum of Factitious Disorders. Washington, DC: American Psychiatric Press, Inc.

***Book Reviews** of Spectrum of Factitious Disorders*:

Pankratz, L. (1997) in: The New England Journal of Medicine, 335(26):2003-4
Folks, D.G. (1997) in: Psychiatric Services, 48(12):1603

Yorker, B.C. (1993). Child Psychiatric Nursing. In: Taylor, C. (Ed.). Essentials of Psychiatric Nursing. St. Louis, MO: C. V. Mosby.

Yorker, B.C.(1993). Family law. In: Fawcett, C. (Ed.) Family psychiatric nursing. St. Louis, MO: C.V. Mosby.

Yorker, B.C. (1991) Legal and ethical aspects of child psychiatric nursing. In: Clunn, P. (Ed.) Child psychiatric nursing. St. Louis, MO: C.V. Mosby.

Johnson, P. & Yorker, B.C. (1991). Legal issues in adolescent psychiatric nursing. In: Hogarth, C. Adolescent Psychiatric Nursing. St. Louis: C.V. Mosby.

Yorker, B.C. (1990). Nurses accused of murder. In Lindeman, M. and McAthie, C. Eds. Nursing Trends and Issues (Reprinted in its entirety from the American Journal of Nursing), 88(10), 1327-1332

Editorials: Yorker, B. C. (2003) Guest Editorial for the theme issue on forensic nursing and Violence. Issues in Mental Health Nursing 24:593.

Yorker, B. (1997) Editor's note on: Early recollections: A source of healing and encouragement with older persons. Directions in Gerontological Nursing. 3(5)

Yorker, B. (1977) Editor's note on: Symptom Management and Relapse Prevention: A Wellness Approach. Directions in Psychiatric Nursing. 2(2)

Yorker, B. (1995) Editor's note on: Diagnosis and Management of Anxiety Disorders in Children and Adolescents. Directions in Psychiatric Nursing. 1(2)

Articles in non-refereed Publications:

Yorker, B. (1998) DFCS needs therapists who can treat Munchausen by Proxy. Georgia Association for Marriage and Family Therapy Newsletter. May, p.3-6.

Yorker, B. (1996) Nurses in Georgia care for survivors of sexual assault. Georgia Nursing, 56(1), 5-6.

Yorker, B. (1996) Sexual Assault Nurse Examiners: A SANE approach to rape and violence. Pulse Magazine, 5(1), 8-9.

Yorker, B. (1994). Medical Futility - The legal and ethical issues. Pulse Magazine, 3(11), 6-7.

Yorker, B. (1992). Elements of a malpractice lawsuit. Pulse Magazine, 1(2), 6-7.

Kendall, J. & Yorker, B. (1988). Child and adolescent psychiatric mental health nursing in Georgia. Georgia Nursing, XLVII(5), 9.

Book Reviews:

Yorker, B.C. (2006) Forensic Nursing. Review of three texts. Journal of Forensic Science. 51:1438-1439.

Yorker, B.C. (2003) The Wind Catches You and You Fall Down. By Anne Fadiman. In the CAPSAC Advisor

Yorker, B.C. (1999) Touched. By Scott Campbell. In the Journal of Child and Adolescent Psychiatric Nursing. 12(1):___.

Jackson, C. & Yorker, B. (1992). Children of chemically dependent parents in the Journal of Psychosocial Nursing, 30(4), 38.

Poems:

Yorker, B. "The Rain and Their Dreams" in The Journal of Child and Adolescent Psychopharmacology, 1(4), 297, 1991.
Reprinted in the National Alliance for the Mentally Ill, Children and Adolescents Network Newsletter, Vol. 2(2), 1992.

Also reprinted in Styles, M., & Moccia, P. (Eds.). On Nursing: A Literary Celebration. New York: National League for Nursing, 1993.

Crofts, B. "Cancer Ward" in Birthstone, San Francisco, West Coast Print Center, 1978.

Editorial Boards:

Editorial Board of the Journal of Child and Adolescent Psychiatric Mental Health Nursing, 1988-2013. Section Editor for "Cultural Perspectives", 1997 to 1999

Editorial Board of the Journal of Nursing Law, 1993-2012.

Editorial Board of Journal of Aggression, Maltreatment & Trauma, 1997-present. Associate Editor for Nursing, APSAC Advisor(American Professional Society on the Abuse of Children), 1996-present.

Editorial Board of Directions in Psychiatric Nursing, 1994-2000

Section Editor for "Legal Issues" in the American Association of Occupational Health Nurses (AAOHN) Journal, 1989-1994.

Editorial Board of Directions in Gerontological Nursing, 1997-2000

PAPERS & SCHOLARLY PRESENTATIONS: (selected)

International:

Termination of Parental Rights in Extreme Cases of Munchausen Syndrome by Proxy, presented at the XIXth ISPCAN International Congress on Child Abuse and Neglect, Istanbul, Turkey, 2012 (refereed)

Legal and Ethical Issues of Covert Video Surveillance of Munchausen Syndrome by Proxy presented at the XVIIth ISPCAN International Congress on Child Abuse and Neglect, Hong Kong, SAR China, 2008

The related factors of adherence among depressive outpatients in Taiwan
Su-Ching Sung, Mei-Yu Yeh, Beatrice Yorker, 18th International Nursing Research Congress Focusing on Evidence-Based Practice, Vienna, Austria, 2007

Covert Video Surveillance of Munchausen Syndrome by Proxy in a Pediatric Hospital Setting presented at the XVIth International Society for the Prevention of Child Abuse and Neglect ISPCAN, York, England, 2006, International Association of Forensic Nurses, Vancouver, BC, 2006, and XVth Congress ISPCAN, South Africa, 2000.

Stresses and Resources of Grandparents Raising Grandchildren: Results of a Multimodal Intervention Program presented at the Global Nursing Perspectives, Rome, Italy, 2003 (refereed)

A National Survey of Prosecutors Regarding Physical Examinations of Child Abuse by Non-physicians. Presented with Kelley, S.J. at the International Society for the Prevention of Child Abuse and Neglect, Durban, South Africa, 2000 (refereed).

Serial Murder in hospitals and Perceptions of Child Advocacy Centers Regarding Sexual Assault Nurse Examiners presented at the 5th International Conference in Clinical Forensic Medicine of the World Police Medical Officers, Vancouver, Canada, 1999, (refereed)

Munchausen Syndrome by Proxy in Professional Settings: Nurses Accused of Murder, presented at SECAD/98 An International Conference for Alcohol and Drug Addiction Professionals, Atlanta, GA, 1998 (invited)

Preventing Child Abuse and Neglect by Supporting Grandparents Raising Grandchildren: A Nursing Intervention Study, presented with Kelley, S. At the Sixth International Congress on Mental Health Nursing, London, 1997 (refereed)

Stressors and Coping of Grandparents Raising Grandchildren presented with Kelley, S. J. at the Third International Conference of the Global Network of WHO Collaborating Centres
for Nursing and Midwifery. Manchester, UK 2000 (refereed)

Nurse Protocol for the Prevention and Treatment of Child Abuse, presented at Symposium on Intersectoral Approach to Management of Child Abuse hosted by the Regional Director, Department of Health, Durban Functional Region, University of Durban, Westfall, South Africa, 1997 (invited)

National: Serial Murder by Healthcare Providers presented at the American Academy of Forensic Sciences, San Antonio, TX, 2007, (refereed) the Hospital Association Work group on Malicious Healthcare Providers, Chicago, IL, 2005, and the International Association of Forensic Nurses conference, Chicago, IL, 2004.

Covert Video Surveillance of Munchausen Syndrome by Proxy presented at San Diego Childrens' Hospital Conference on Child Maltreatment, San Diego, 2005.

Expert Testimony in Child Abuse Cases presented at the National Child Advocacy Center Conference, Huntsville, AL, 2004, invited

Serial Murder in Hospitals, presented at the Forensic Nursing Clinical Update 2001, Phoenix, AZ (invited)

Crime in the Hospital and the Community: Serial Murder in Hospitals. American Academy of Nursing Meeting and Conference, 2000, San Diego, CA. (refereed)

Investigation, Prosecution & Evidence Collection: How Law Enforcement, Legal and Medical Service Professionals Should Work Together Advanced Training Institute with Johnson, M. and Lamb, N. presented at the 15th Annual Training Symposium of the Georgia Council on Child Abuse, Atlanta, GA, 1999 (invited).

Munchausen Syndrome by Proxy: Definitional Issues presented with Ayoub, C. at the 7th Annual Colloquium of the American Professional Society on the Abuse of Children, San Antonio, TX, 1999 (refereed)

Professionals who create critical incidents: Epidemics of Factitious Disorders in Hospitals. Presented at the International Association of Forensic Nurses conference, Pittsburgh, PA 1998 (refereed)

Attitudes toward non-physician providers of child sexual abuse examinations: Results of two national surveys. Presented with Ferrell, J. & Kelley, S. at the International Association of Forensic Nurses conference, Pittsburgh, PA 1998, (refereed)

The Relationship Between Asthma Self-Regulation, Family Functioning, Age, Severity and Triggers of Asthma presented with A.L. Campbell at the National Association of Child and Adolescent Psychiatric Nurses Conference, Atlanta, GA 1998 (refereed)

Sudden Infant Death Syndrome (SIDS), Suffocation, and Munchausen by Proxy presented with C. Ayoub and R. Reece at the APSAC Colloquium, Chicago,1998.

Committing to Teaching and Learning and Doing Something About It. Presented with L. Williams, L. Wachniak, D. Graf, and P. Colbenson. AAHE National Conference on Higher Education. Atlanta, GA, 1998 (refereed)

Cross Cultural Exchange with Child Abuse Professionals in South Africa presented with Kelley, S. at the National Association of Child and Adolescent Psychiatric Nurses, Philadelphia, PA, 1997. (refereed)

Physician and Non Physician Abuse Examiners: Practice Roles, Standards, and System Issues, with Kelley, S., Block, R., Ferrell, J. and Wilson, C. at the Fifth National Colloquium of the American Professional Society on the Abuse of Children, Miami, FL, 1997. (refereed)

Coordinated Interdisciplinary Approaches to Factitious Disorder by Proxy, with Ayoub, C., Rainey, R., Alexander, R., and Schrier, H. at the Colloquium of the American Professional Society on the Abuse of Children, Miami, FL, 1997 (refereed)

Post-Tenure Review: Experiences from the Front, presented at the Fifth AAHE Conference on Faculty Roles and Rewards, San Diego, 1997 (invited)

Transforming Faculty Development through the World Wide Web, presented with Williams, P. At the Fifth AAHE Conference on Faculty Roles and Rewards, San Diego, 1997 (refereed)

Children Raised in Intergenerational Families, in session titled "Alternative Family Structures: Blessings and Burdens" with Kelley, S.J. presented at the American Academy of Nursing Annual Meeting and Conference, Orlando, FL 1996 (refereed)

Legal Issues of Covert Video Surveillance of Factitious Disorder by Proxy. Presented at the 43rd Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Philadelphia, PA, 1996 (refereed)

Transcending the Classroom: Educational Uses of Synchronous Computer-Mediated Communication. With Harris, L., presented as a "Project Information Exchange" at the EDUCOM '96 conference. Information Technology: Transcending Traditional Boundaries. Philadelphia, PA, 1996 (refereed)

Using a MOO to Enhance Teaching and Learning about Cultural Diversity. Presented at the 2nd Annual AAHE Teaching Learning and Technology Summer Institute, Scottsdale, AZ, 1996 (refereed)

Case Studies of Bibliotherapy with Homeless Children with G. Farkas presented at the Ninth Nursing Research Day hosted by the Louisiana State University Medical Center and Sigma Theta Tau International Honor Society, New Orleans, LA ,1995. (refereed)

Access Issues: Who Can Administer Influenza and Pneumococcal Vaccines, and Who is Eligible for Medicare Reimbursement? Presented at the "Improving the Performance of Influenza and Pneumococcal Vaccines in Adults Conference",Washington,D.C.1995.

Alternatives to Seclusion and Restraint: An Intervention Study poster session presented with G. Walker-Burt, L. Butts, E. Nemuth & S. Wilson at the Association of Child & Adolescent Psychiatric Nurses, Orlando, FL 1995 (refereed)

FUNDED GRANTS:

Centers for Disease Control and Prevention Public Health Leadership Grant for Leadership Development in Health Disparities with Kennedy Krieger Institute at Johns Hopkins University, Children's Hospital of Los Angeles, USC Center for Excellence in Developmental Disabilities and California State University, Los Angeles. PI for CSULA, funded for $350,000, 2010-2016. Cooperative Agreement Number 5U50MN000025-04

Satellite BSN Program at Cañada College, PI. Funded for $7.5 million over six years with continuation option for $10 million over ten years by Sequoia Healthcare District, 2004-2011.

Training 250 Clinical Nurse Educators in the San Francisco Bay Area. Approved for $250,000 in funding by the Gordon and Betty Moore Foundation, 2005-2006.

Foster Care Nurses' Training, PI, funded by the California Child Health Division for $198,000 2001-2003. Collaborative with School of Nursing and Bay Area Academy.

A Randomized Clinical Trial of *Meridia* in the Treatment of Binge Eating Disorder. Lilenfeld, L., Principal Investigator. Funded for $100,000 by Knoll Pharmaceuticals, 2000-2001 (5% release time)

Impact of STARBRIGHT WORLD with Inner City, Minority Children with Chronic Health Problems. Co Principal Investigator with Alexander, R. Funded for $5,000. by Healthcare Initiatives Foundation, Steven Spielberg, CEO, 2000.

Neglected Children in Intergenerational Kinship Care. Kelley, S.J., Principal Investigator, funded through 2001 for $750,000 by the National Center for Child Abuse and Neglect, DHHS, 1996-2001. (20% release time)

Project Healthy Grandparents' Children's Program, S.J. Kelley, Project Director, Funded for $310,100 from the Goizuetta Foundation 1999-2001 (5% release time)

Project Healthy Grandparents' Children's Program, S.J. Kelley, Project Director, Funded for $100,000 from the Hasbro Children's Foundation,1999-2000

Improving Responses to Child Abuse, S.J. Kelley, Principal Investigator, B.C. Yorker and D. Whitley, Funded for $12,000, Research Enhancement, Georgia State University. 1999.

Review of Georgia Child and Adolescent Psychiatric Mental Health Treatment Facilities. Subcontract from the Carl Vinson Institute of Government, University of Georgia. Funded by the Georgia D. H. R. for $100,000, 1998. (5% release time)

Project Healthy Grandparents. Kelley, S. , P.I. Funded by the Georgia Department of Human Resources for $75,000 for 1997-1998, (5% release time)

South Africa Collaborative, GSU "Internationalizing the Curriculum"initiative with Thachenkary, C.S., Brack, C. Brack, G., Kelley, S. Whitley, D., funded for $5,000, 1997.

Project Healthy Grandparents. Kelley, S., P.I. Funded by the Georgia Department of Human Resources $75,000 for 1996-1997, (5% release time)

Creating an interactive MOO at Georgia State University. With Sattelmeyer, R. Co-P.I., Pullman, G., Wiseman, P., and Mitchem, P., funded for $18,000 by Quality Improvement Fund, Georgia State University, 1996.

Empowering Communities to Use Nurses as Expert Witnesses in Court Cases Involving Issues of Physical and Sexual Child Abuse in Georgia. Applied Research Center. P.I. $93,000 funded by the Georgia Department of Human Resources, 1995-1996.

An investigation of the Use of Nurses as Expert Witnesses in Court Cases Involving Issues of Physical and Sexual Child Abuse in Georgia. Applied Research Center, with Doss, C.B., P.I., funded by the Georgia Department of Human Resources, for $91,000. 1995.

An investigation of the Use of Nurses as Expert Witnesses in Court Cases Involving Physical and Sexual Child Abuse in Georgia. Applied Research Center, with Doss, C.B., P.I., Levine, N. & Hogue, L. $91,000 funded by the Georgia Department of Human Resources, 1994.

Use of the Child Medical Fear Scale Among School-age Children with Emotional Disorders, Funded for $2,500. College of Health Sciences Research Grant, co-investigator, with A. Wilson, 1992.

The Relationship Between Seclusion, Restraint and Ward Atmosphere on Two Inpatient Adolescent Psychiatric Units. Funded for $1,800. GSU Research, 1990.

HONORS & AWARDS:

American Professional Society on the Abuse of Children (APSAC) Outstanding Professional, 2017.

Elected as a Member of the American Academy of Forensic Sciences, 2006 to present.

Elected as a Fellow to the American Academy of Nursing, 1991 to present.

Outstanding Educator, 1997. Award presented by Advanced Practice Psychiatric Nurses of Georgia.

Spokesperson for the American Association of Colleges of Nursing media referral service on the topics of nurses accused of murder and sexual abuse, 1990-present.

TEACHING:

Recent Courses:

CSULA

NURS 3910 Psychiatric Nursing Practicum, 2017-present. NURS 498 Elective in Forensic Nursing. Summer 2008- 68 students, Spring 2008-134 students, Winter 2008- 85 students

SFSU

NURS 580 Senior Practicum 2001, 2002, 1003, 2004. Lucille Packard Children's Hospital, California Pacific Medical Center, Stanford University Hospital, Sequoia Hospital.

Doctoral Committees/Dissertations:

Frith, K. (2001) Evaluation of the Use of Technology in Nursing Education. Member, Dissertation Committee

Lehr, S. (2001) Aids Prevention and the Influence of Fathers on Sexual Behaviors of Their Adolescent Sons. Member, Dissertation Committee

Roush, D. (2000) Ethics education in university system of Georgia schools of nursing. Chair, Dissertation Committee.

Brewer, K. (2000) Leaving the Abyss: A Phenomenological Study of Women's Recovery from Alcoholism. Member, Dissertation Committee.

Rawls, J. (1998) Faculty-Administration Conflict: Bridging the Gap for Collaborative Leadership in Higher Education. Member Dissertation Committee

Crenshaw, C. (1998) The Experience of Women Who Participated in an Eating Disorder Treatment Program Designed to Develop a Feminist Consciousness. Member, Dissertation

Camann, M.A. (1997) Evaluation of Family Caregiving Experience to Compare Three Mental Health Service Delivery Programs. Member, Dissertation Committee

Campbell, A.L. (1997) Relationships Between Family Environment Factors and Self-management Practices of 8-12 year-old Children with Asthma. Member, Dissertation Comm.

Greiner, D. S. (1993) A Philisophic Inquiry into Authoritative Knowledge in Nursing. Member, Dissertation Committee

Wilson, L. S. (1992) The Reporting Decisions and Ethical Reasoning of Professionals in reporting Child Abuse. Member, Dissertation Committee (Dept. Couns. and Psych. Services)

Contribution to Student Accomplishments:
Student Awards:

Huber, L. (1994) First Place award in Williams & Wilkins Publishers graduate student scholarship award. (Major Advisor)

Student Publications:

Myers, J. (1996) Workshop Effectiveness: Nurses as witnesses in court cases involving physical child abuse. Journal of Nursing Law 3(2):35-44.

Campbell, A.L. (1995) What maintains the myth of the Wicked Stepmother? Journal of Child and Adolescent Psychiatric Mental Health Nursing 8(4):17-22

Huber, L. (1994) Clinical Nurse specialist and staff nurse: Colleagues in integrating nursing research with clinical practice. Clinical Nurse Specialist 8(3): 118-121.

Scholarly and Educational Videos:

Nursing and Informed Consent, Health Sciences Television Network, (H.S.T.N.), 1999.

Providing Deposition Testimony in a Legal Case, H.S.T.N., Primedia Corp. 1999

Workers' Compensation Law, H.S.T.N., Primedia Corp. 1999.

Update on the Americans with Disabilities Act, H.S.T.N., Primedia Corp. 1999

Munchausen Syndrome by Proxy, H.S.T.N., Primedia Corp. 1998.

Psychotherapy/Treatment with Munchausen Syndrome by Proxy Perpetrator: Session IV Georgia State University Learning Resource Center, 1998

Legal Considerations in Psychiatric Care, Produced by Long Term Care Network, a division of Westcott Communications, 1997.

A guided tour of the World Wide Web, Faculty Enrichment Forum, GSU, 1995.

Play Therapy Assessment of a Three-year-old With a History of Possible Sexual Abuse. Georgia State University Learning Resource Center, 1993.

Student Nursing Research Presentations, Qualitative and Quantitative Studies in Child and Adolescent Psychiatric Mental Health Nursing, 1992.

Hosted an Invitational Conference for Communities Interested in Starting a Sexual Assault Nurse Examiner (SANE) Program. GSU Office of Continuing Education, 1996.

Presented Legal Issues Associated with Munchausen Syndrome by Proxy. Institute of Continuing Legal Education, Program on Child Abuse. Atlanta, GA, 1995.

PROFESSIONAL SERVICE:

Offices
Held: Board Member, Prevent Child Abuse America, 2013- present, Chair of the Programs, Research and Policy Committee, 2014-2018
Board Member of the American Professional Society on the Abuse of Children, (APSAC) 1996- 98, Munchausen by Proxy Task Force member, 1995-present
President of the California Chapter of APSAC, 2006- 2010, Treasurer 2014-present.
Chair of the Expert Panel on Violence of the American Academy of Nursing. 2000 - 2004
Vice President, national Association of Child and Adolescent Psychiatric Nurses, 1994- 98

Membership:
American Academy of Nursing, 1991 to present
American Academy of Forensic Sciences, 2006-2010
American Association of Higher Education, 1994 to 1999
International Society of Psychiatric Nurses, 1986-1992
American Association of University Professors, 1994 to 1998
International Association of Forensic Nurses, 1996- 2008
Sigma Theta Tau International Nursing Honor Society, 1989 to 1996
American Society of Law and Medicine, 1987 to 1994
Georgia Bar Association, 1989 to present (Inactive as of 2002)
Family Law Section of the Georgia Bar Association, 1989 to 1993
American Professional Society on the Abuse of Children, 1990 to present
American Nurse's Association, 1975 to present
The American Association of Nurse Attorneys, 1994 to 2006.

Publications arising out of task force/committee reports:

Munchausen by Proxy: Clinical and Case Management Guidance. Alexander, R. Ayoub, C. et. al (2018) *APSAC Advisor* 30(1):8-31. American Professional Society on the Abuse of Children (APSAC) Taskforce on Munchausen by Proxy.

American Academy of Nursing Expert Panel on Violence. Policy Recommendations for Nurses Caring for Victims of Torture. Issues in Mental Health Nursing 24:595-597 and Policy Recommendations on Workplace Violence. Issues in Mental Health Nursing 24:598-604.

Ayoub, C. & Alexander, R. (1998) Definitional Issues in Munchausen by Proxy. APSAC Advisor 11(1):7-9. Report of the Munchausen by Proxy Task Force.

Regents Guide to Understanding Copyright and Fair Use, University System of Georgia, http://www.peachnet.edu/admin/legal/copyright/ Biesinger, K. Christenberry, R. Cummings, C. Drake, M. Gunnells, G. Patterson, L.R., Yorker, B. & Potter, W.G., Chair (1997) Journal of Intellectual Property Law. Volume 5(1):243-305.

Community Service:

Prevent Child Abuse America, Board Member, 2010- present, Chair of the Programs, Research and Policy Committee, 2014-present.

Clinical Committee, Memorial Healthcare of Southern California 2007-2011.

Health Services Advisory Council, Head Start of San Francisco, 2001- 2005.

Hospital Council of San Francisco, Strategic Planning Group for Increasing Nursing Enrollment, 2001-present.

San Francisco General Hospital Re-Build Task Force, 2002-2004.
San Francisco Private Industry Council, 2001- 2003.

Sexual Offender Registration Review Board, administered by the Criminal Justice Coordinating Council of Georgia, appointed in 1997, Elected Chair 1997-2001.

Consultations, Expert Testimony:

Gaines v. Cumberland County Hospital, 700 SE 2d 751 - NC: Supreme Court, 2010. Expert witness in case involving failure to report child abuse resulting in $24.5 million verdict for the victim/family.

Consultant regarding civil litigation against hospitals in New Jersey, Arizona, and Texas in cases involving wrongful death by nurses convicted of murder.

Appointed to the American Hospital Association (AHA) and Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) work group on Patient Safety and Protection from Malicious Healthcare Providers, 2004 to 2008.

Consultant to Assistant U.S. Attorneys in the United States District Court for The United States v. Kristen Gilbert , Springfield, MA, February 22, 2001

Consultant to the District Attorney for State of Indiana v. Orville Lynn Majors, Clay Co. Circuit Court, October 17, 1999.

Expert testimony upheld by the Georgia Court of Appeals: In the Interest of C.M. and M.M., Children. 236 Ga. App. 874, 513 S.E. 2d 773 (1999).

Expert Witness in juvenile proceedings and criminal prosecutions involving evaluation of Munchausen Syndrome by Proxy cases

Consultant to State Victim Witness Program regarding Sexual Assault Nurse Examiners

Consultant to the Georgia Network to End Sexual Assault regarding Sexual Assault Nurse Examiner credentialing

Consultant on a variety of criminal and civil cases involving the standard of nursing care

Clinical Supervisor for American Nurse's Credentialing Center Certification in Child and Adolescent Psychiatric Mental Health Nursing.

CITIZENSHIP:

Born in Harare, Zimbabwe (Salisbury, Rhodesia)
United States citizen since 1969

THE LEGAL SIDE

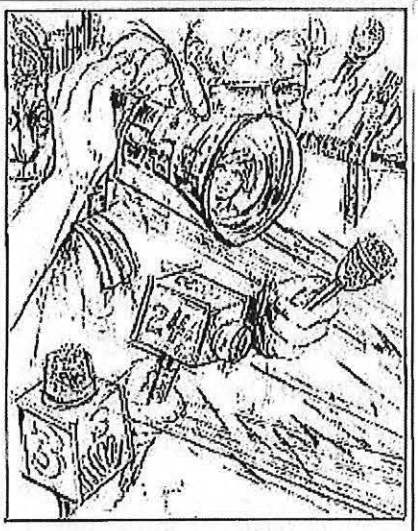
NURSES ACCUSED OF MURDER

BY BEATRICE CROFT YORKER

When clusters of patient deaths are detected in quality assurance and risk management programs, epidemiological studies often trace the causes to infectious agents or chemicals(1,2). In at least nine cases since 1975, however, such investigations have led to the indictments of nurses for the murder of patients in their care. Eight of the cases involved RNs and in one case in Texas, a licensed vocational nurse was charged.

In 1975, a case began when hospital administrators and medical staff in Michigan investigated a series of breathing failures and discovered pancuronium bromide (Pavulon) in several patients' bodies. The FBI and Centers for Disease Control (CDC) were contacted. As a result of an epidemiological study, the CDC traced the deaths to intravenous injections given in the ICU on the evening shift (3). Two evening-shift nurses were convicted, but the appellate judge struck down the verdict because of procedural violations of the nurses' civil rights and violations of the rules of evidence(4).

A 1980 case in Nevada began with rumors that nurses were running a betting pool on when patients would die. Murder charges



were brought against one nurse who was accused of tampering with life support equipment to raise her odds of winning. However, no cluster of deaths was identified, and all charges ultimately were dropped because of insufficient evidence(5).

Next, when infants on a cardiology unit in Toronto showed high postmortem digoxin levels following a series of 28 unexplained deaths over a nine-month period, the CDC correlated the cardiopulmonary arrests with the presence of a particular nurse on the night shift (6). The judge, however, dismissed the charges against the nurse who was arrested, citing insufficient evidence(7). Interestingly, the CDC study linked a different nurse to the suspicious deaths, but that nurse was never arrested.

Then came a California case concerning several patients who died with signs of lidocaine toxicity; postmortem reports revealed high concentrations of the drug. As many as 27 lidocaine-related deaths in two different hospitals were correlated with the presence of one ICU nurse. His home was searched, and vials of lidocaine were discovered. The nurse was found guilty on 12 counts of murder and sentenced to death. His case is on appeal and he maintains his innocence(8).

In Texas, hospital administrators noted that a particular LVN was present during a high number of cardiopulmonary arrests(9). Not wanting to risk publicity or lawsuits, the hospital set forth a policy excluding LVNs from the ICU. Unfortunately, the LVN took a job with a private pediatrician, and suspicious breathing failures started to occur among children in the physician's office(10). A local hospital traced succinylcholine chloride (Anectine) as the likely agent, and the LVN was convicted of murder(11).

In Florida, an RN was linked to a high number of insulin-related deaths in a nursing home(12). The nurse pleaded guilty to four counts of second-degree murder and to one count of attempted murder. The judge sentenced her to 65 years' imprisonment(13).

A Maryland nurse was acquitted because the judge said statistical evidence alone is insufficient to convict someone of murder. The nurse had been indicted in 1985 after a CDC study revealed her patients were 47.5 times more like-

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ly than other nurses' patients to suffer cardiac arrest(14).

A Georgia case was noteworthy because of the hospital's response when suspicious cardiopulmonary arrests were detected on the evening shift. Within a month, a very tight protocol was in place to control use of potassium chloride (KCl). The drug had to be signed out, and potassium blood levels were measured on all patients who arrested. For the next three months there were no mysterious arrests. Then, a nurse was convicted of criminal assault when KCl was found in the IV tubing of a blood transfusion that the nurse had just started(15).

This year, a New York case received national attention when a patient suffered a breathing failure immediately following an IV injection by a nurse. An investigation led to an indictment for one count of murder and three counts of assault. Although this nurse confessed, the admissibility of his confession has not yet been determined(16).

Also this year, a nurse in North Carolina was convicted of second-degree murder after he was found to have deliberately omitted a prescribed dose of l-norepinephrine (Levophed) (17).

THE ARM OF THE LAW

In order to arrest a suspect, probable cause (more evidence for than against) must exist. In the nine cases described, the correlation between a nurse's presence and a high number of suspicious deaths was deemed sufficient to establish probable cause and to bring indictments by grand juries.

Next comes the trial, which can take months and even years of preparation because of the extensive expert testimony required. The California case and the Maryland cases, for example, each took two years of preparation.

Of the nine cases since 1975, four led to convictions, and one nurse pleaded guilty. Charges were dropped against two and are still pending against one.

In six cases, the CDC was called in to conduct epidemiological studies. The length of time that hospital administrators formally investigated these "epidemics" varied from 1 to 15 months before the district attorney's office was called(14,15).

Unless the nurse is caught in the act, proof of murder rests primarily on a statistical correlation. Typically, the events preceding identification of a suspect in the nine cases included some combination of the following:

> Twenty-seven deaths in two different hospitals were correlated with the presence of one ICU nurse.

- ☐ a significant rise in cardiopulmonary arrests or deaths in a particular patient population;
- ☐ an unusually high rate of successful cardiopulmonary resuscitation. (A patient in Georgia arrested eight times in one month. Ten patients in Maryland had multiple arrests even though most unwitnessed cardiopulmonary arrests do not respond to resuscitative measures.)
- ☐ cardiopulmonary arrests or deaths inconsistent with the patients' conditions;
- ☐ multiple cardiac or respiratory arrests in the same patient;
- ☐ cardiopulmonary arrests or deaths localized to a particular shift; and
- ☐ postmortem examinations revealing toxic levels of an injectable substance.

BUT WHY?

One of the most puzzling issues raised is that if indeed some of the nurses did hasten the death of patients, why? Only the three nurses in Maryland, Georgia, and New York confessed. None of the nurses had any history of psychosis. In only one case was an insanity defense used against the murder charges. (The Georgia nurse had been molested as a child and had had a history of entering dissociative states, a factor invalidating her confession. She was found guilty of assault)(18).

Euthanasia, or mercy-killing, emerged as a possible motive in the Georgia case. During the investigation, the nurse said she could not stand to see her patients suffer. In her confession, she said she thought the patients wanted her to help them die. She was described as a particularly compassionate nurse, and as a child she had seen her adoptive mother kept alive on life-support equipment(19). The patients she was accused of murdering were either critically or terminally ill. Thus, an argument could be made that this nurse was motivated by compassion.

Another motive, hypothesized in the cases of nurses convicted in Michigan, California, and Texas, is psychologically complex. These nurses were described as being excited or exhilarated when participating in a code(4,20,21). Indeed, it is satisfying to perform cardiopulmonary resuscitation well and see the patient recover. Thus, the prosecuting attorneys in the Michigan trial proposed that the nurses probably did not intend to have their patients die—they simply wanted to induce a cardiac or respiratory arrest(22).

Another explanation offered is that some of these nurses wanted to justify the need for an intensive care unit. In Texas and Canada, investigators noted that suspicious cardiopulmonary arrests coincided with questions regard-

ing the cost-effectiveness of pediatric ICUs.

UNDUE PROCESS

Another facet of these cases was the "witch hunt" atmosphere in the investigations. At least half the nurses in this study asserted due process violations. Sometimes the jury evaluated these violations during the trial, together with all other evidence, in an attempt to reach a verdict. In Michigan, the judge considered the investigative violations sufficient to reverse the conviction. In the California case, evidence was deemed inadmissible because procedural safeguards regarding the search of the suspect's home were insufficient(23).

In all the cases involving the media, hospital representatives may have felt compelled to provide the community with a plausible explanation for its increased death rate. Nurses can provide a ready target for investigations. They are in the hospital around the clock, they are usually the first people on the scene of an arrest, and they have access to the suspected agents. One attorney made the rather extreme comment that being accused of murder may be an emerging occupational hazard for nurses(24).

The evidence used against these nurses almost always was circumstantial and statistical. In response, expert witnesses for the accused questioned the accuracy, for example, of postmortem toxicological examinations on bodies of patients who had died months before. Very little research has been reported on how drug concentrations change in tissues of patients after death.

Even the CDC reports include statements that limit their investigation strictly to epidemiological rather than criminal hypotheses. One investigator cautioned: "As an epidemiological study, our statistical analysis cannot answer whether intentional acts were committed against patients. No matter how strong the association between cardiac arrests and care by a specific person, a direct causal relationship cannot be proved by statistical association"(17).

These cases have had a profound impact on nursing. Communities served by the hospitals in question were understandably shaken. Families of patients whose deaths have been labeled suspicious find their grieving process interrupted for months and even years by the possibility of murder as the cause of their relatives' deaths. Trust in the care provided by these hospitals is eroded.

> Unless the nurse is caught in the act, proof of murder rests primarily on a statistical correlation.

The whole state is usually subjected to detailed media coverage of each case. Brief and sometimes distorted vignettes of the trials receive national coverage. Follow-up, however, is often sketchy. Four times more stories were printed about the *charges* against the Nevada nurse than about her *acquittal*.

Beatrice and Philip Kalisch, discussing media coverage of the Nevada nurse's trial, pointed out that "Public reaction was no doubt further intensified by the natural sense of shock and outrage that occurs when a traditional source of good suddenly appears evil. Since nurses are entrusted with people's lives, the public has a need to believe not only that nurses are knowledgeable, but also that they are benevolent"(5). These reported scandals touch nearly everyone's perception of nurse-patient relations.

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An Analysis of Murder Charges Against Nurses

Beatrice Crofts Yorker

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Since 1974, at least 12 nurses have been charged with murder following mysterious epidemics of adverse patient incidents. Until recently, each case was treated as an isolated incident which generated tremendous sensational media publicity. Charges against these nurses were typically brought after the hospital noticed an unusually high number of cardiopulmonary arrests in a particular patient care area. In some cases, the Centers for Disease Control confirmed an epidemic of cardiopulmonary arrests and attributed them to the presence of a particular nurse. In many cases, nurses themselves called attention to the high number of adverse patient incidents. Sometimes a quality assurance program within the hospital noticed the epidemic, and occasionally patients or their families complained that a cardiac arrest in the hospital was suspicious. In all of the cases, the nurses were charged with injecting patients with toxic doses of common medications and inducing cardiopulmonary arrests that resulted in a code, or resuscitative effort. The high number of codes and the dramatic survival rate of patients during these "epidemics" made health care personnel suspicious. The majority of suspicious codes occurred on the evening or night shift; however, some nurses did not always work a regular shift, and in those cases codes clustered around the nurse's schedule. Table 1 summarizes the cases studied to date.

Legal Case Summaries

The following summaries describe the aspects of cases that illustrate serial murder and nurse-associated epidemics. Some summaries include data supporting nurse criticism that a witch-hunt-like atmosphere surrounded the investigations.

Table 1

Year	Location	CDC Investigation	# of suspicious deaths	# Counts of murder	# Counts of Assault	Conviction Appeal
1974	Scotland	no	23	1	4	yes, appealed murder and won
1975	Michigan (2 nurses)	yes[1]	10	1	3	yes, appealed, conviction set asside
1981	Canada	yes[2]	18	4	6	no
1981	California	no	27	12	12	yes, lost appeal
1982	Texas	yes[3]	20	1	0	yes, lost appeal
1984	Florida	yes[4]	12	4	0	yes
1985	Maryland	yes[5]	10	3	7	no
1985	Georgia	yes	10	6	20	yes, lost appeal
1987	New York	no	7	1	3	yes
1992	Alabama	no	18	1	?	yes, appealing
1993	England	no	4	4	8	yes

Table 1 (continued)

Type of Unit	Shift	Age of Nurse	Sex of Nurse	Confession	Type of Assault	Psychiatric History
geriatric	not known	34	F	no	injection insulin	yes
ICU & floor	3–11 3–11	29 30	F F	no no	injection Pavulon	no no
ped. ICU & floor	11–7	25	F	no	injection digoxin	no
adult ICU, CCU	11–7	46	M	no	injection lidocaine	no
ped. ICU & outpatient peds.	3–11 in ICU, day in office	31	F	no	injection Anectine	possibly Münch. synd.
nursing home	11–7	29	F	yes	injection insulin	yes, Münch. synd.
ICU	3–11	31	F	yes, inadmissible	injection KCl	no
ICU	3–11	23	F	yes	injection KCl	yes, dissociative disorder
ICU, cardiology floor	11–7	27	M	yes	injection Pavulon & Anectine	no
ICU, various floors	p.r.n.	36	M	no	injection lidocaine epinephrine	no
peds. floor	varied	23	F	only after conviction	insulin, suffocation air embolus	yes, Münch. synd.

Scotland

A 33-year-old ward sister (staff nurse) had been working for four years on a geriatric unit in Scotland when an unusual number of deaths and adverse patient incidents occurred during a one-month period. The nurse was hired with a medical fitness certificate; however, there was evidence to suggest psychiatric treatment in her past.[6] Some patients reported feeling terrible after injections administered by that particular nurse. There were eyewitness accounts of the nurse giving injections without orders. She claimed these were only sterile water. Laboratory analysis revealed traces of insulin in several syringes used by the nurse, and postmortem analysis revealed a chemical picture consistent with administration of excessive insulin.

The nurse was charged with one count of murder, two counts of unauthorized administration of medication, and four counts of assault. She was found guilty of murder and three assaults and sentenced to life imprisonment. She successfully appealed her murder conviction on grounds that instructions regarding her testimony were in error.[7] She was released from prison, and by 1984, she was restored to the general Nursing Register in the United Kingdom.

Michigan

After a series of suspicious breathing failures in a Veterans Administration hospital, the Federal Bureau of Investigation set up investigation offices in a wing of the hospital. Their "search for the killer" included multiple interrogations of patients, staff, and former employees. The Centers for Disease Control began an epidemiologic study. National broadcast news quoted the hospital administration as saying a crime had been committed involving 35 patients who had stopped breathing on 51 occasions during a six-week period. The suspected agent, pancuronium bromide (Pavulon), was described as similar to curare, a powerful muscle relaxant used by native South Americans to paralyze their prey. Two Filipino nurses who were told by the FBI they were suspects finally hired an attorney after being interrogated intensively without legal counsel. One of the nurses was interrogated for more than six hours and then told, "Now your life is over. I know you are a religious person. You had better light a candle for yourself."[8] After the nurses were arrested, Filipino and nursing groups contributed more than $100,000 to the nurses' defense fund. Despite the fact that their attorney assured the FBI that the two suspects would appear voluntarily if arrested, both women's arrests were publicly televised, much to the horror of one of their children who was watching the news.

Evidence that supported the defense of the two nurses was excluded from the trial. A newspaper editorial questioned the tactic of identifying suspects before probable cause had been established. The Centers for Disease Control established the presence of an epidemic, but could not specifically identify a perpetrator.[9] During jury selection, the *Detroit Free Press* ran a front-page story on

the suicide of the former evening shift supervisor at the V.A. hospital. She had a history of emotional lability following chemotherapy for cancer, a history of shoplifting, and had previously been treated at a psychiatric hospital where she reportedly confessed to the killings. The psychiatric staff dismissed her remarks as part of her mental illness. The Judge did not allow the psychiatric records into court. A nurse's aide who was also present during most of the breathing failures admitted giving unauthorized medications and neglecting patients. She was given immunity for suggesting suspects.

Although the nurses were both convicted of poisoning, they successfully appealed the conviction based on numerous due process violations by the prosecution.[10] The appellate judge concluded, "In considering the nature of the government misconduct, together with the type of circumstantial evidence presented, the Court is left with the abiding conviction that this jury's verdicts could not reasonably have been reached free of the influence of the numerous improprieties that occurred during the course of this long trial."[11]

Canada

The pediatric cardiology unit of a large children's hospital became the focus of investigation after a coroner found high levels of digoxin following two sudden deaths. Preliminary data indicated that an unusually high number of cardiopulmonary arrests occurred on the night shift.

The police began interviewing the nurses who worked on the night shift. One nurse refused to answer some questions at the suggestion of her roommate, who was a law student. She was immediately arrested. A year later, at her preliminary hearing, the judge ruled there was insufficient evidence to justify a murder trial. As part of a four-year, exhaustive investigation, the Centers for Disease Control were called in to conduct an epidemiologic study. The study calculated the relative risk associated with each of the nurses on the night shift. Analysis of the four nurses who worked nights most frequently revealed the risk factor for cardiac arrests occurring with nurse A to be 64.6; for nurse B, 8.2; for nurse C, 6.9; and for nurse D, 5.4.[12] Although the data showed that nurse A's presence was very strongly associated with infant cardiac arrests, nurse B was the one arrested before the study was done.

The regional nurses' association and civil liberties union requested that the investigative report refrain from naming names, as it would be irreparably damaging to name parties before legal charges were brought. After an initial ruling to release names of suspected parties, the nurses' association successfully appealed, and no names were identified in the final report.[13] No further legal action was taken against nurse A, who had the highest statistical association with adverse events.

Serial Murder Among Nurses

Until recently, social scientists dismissed the idea that female serial killers existed. Since the 1970s,

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Serial Murder Among Nurses

Until recently, social scientists dismissed the idea that female serial killers existed. Since the 1970s,

however, research shows that female serial killers do exist and are convicted.[14] Holmes and Holmes discuss five types of female serial killers: (1) women who kill in response to voices or visions, (2) women who kill for money, (3) hedonistic killers who obtain pleasure from killing, (4) disciples who kill under the influence of charismatic leaders, and (5) "power seekers" who deliberately put their patients at risk so they can rush in and save them to appear heroic.[15]

The "power seeker" type of serial killer can be analyzed further using the Münchhausen syndrome by proxy (MSBP) formulation. This is a form of abuse where a caretaker fabricates illness in a dependent to gain attention. The disorder has been documented in numerous case studies that include mothers, babysitters, foster mothers, and fathers or male caretakers as perpetrators.[16] MSBP takes many forms, including falsifying a medical history; injecting the victim with substances such as poisons, medications, or feces; suffocation to induce apnea; adding blood to specimens; and a variety of other creative medical deceptions. Commentators have used the Texas and England cases in Table 1 as examples of MSBP by a nurse.[17]

Linedecker and Burt wrote a book in 1990 called *Nurses Who Kill.*[18] They included nurse's aides in their study. When the number of nurses and nurse's aides charged with serial murder are added together, the number totals 24. Although the incidence of caregiver-associated serial killings is very minute (one to two reported cases per million health care workers per year[19]), the recent increase in reportings may indicate that the problem has been underdocumented.

The Use of Epidemiologic Data

At least five of the cases in Table 1 were investigated as epidemics by the Centers for Disease Control. These investigations have cost up to $255,000 each. The epidemiologist who headed the investigation in Maryland was used as a key government witness. He was subjected to five hours of cross-examination and spent countless days and hours in preparation for the lengthy trial. In spite of the statistical evidence that patients of the particular nurse were 47.5 times more likely to have a cardiac arrest (on the evening shift the figure went up to 100 times more likely[20]) the judge ruled that the evidence in the case was only circumstantial and could not be used as evidence of intentional acts. The *mens rea*, or "state of mind," element of proof of murder was missing. In the Michigan and Toronto cases, the results of the epidemiologic investigations did not play a deciding factor in the prosecution. In Florida and Georgia, the epidemiologic data was useful, but not decisive. In Florida, the nurse was indicted for murder after numerous complaints by nursing staff that her actions were inappropriate and related to an increased number of adverse incidents. In Georgia, the best evidence linking the nurse to the epidemic was proof

by chemical analysis that she administered unauthorized toxic amounts of potassium chloride during a blood transfusion.

Statistical evidence that strongly associates a particular caregiver with patient arrests or deaths may not provide conclusive evidence in a murder trial, but it can be very persuasive evidence in a wrongful death lawsuit. The reason for this discrepancy lies in the difference in burden of proof between criminal and negligence, or civil, lawsuits. In a criminal trial, the evidence has to prove "beyond a reasonable doubt" that the defendant committed the crime. In a civil suit, the standard of proof is "a preponderance of the evidence." Thus, the statistical correlation that a nurse's presence was strongly associated with an epidemic of cardiopulmonary arrests may be a deciding factor in a civil suit. In the Maryland case, even though the nurse was acquitted of murder, she faced eight civil suits that settled for a total of $8.5 million.[21]

Witch Hunts

Perhaps the most distressing aspect of the murder trials against nurses is the sensationalized media emphasis that often plays upon gender or criminal stereotypes. Kalisch, Kalisch, and Livesay[22] discuss the fact that the biggest news stories in recent years have not been about nurses saving lives or advances made through nursing research. Rather, the biggest stories have been about murder allegations. A nurse accused of murder shocks the public because of the paradox it creates. A person dedicated to caring for the sick and vulnerable is accused of committing murder while occupying a trusted position. The allegations, which are frequently not substantiated, receive massive media attention. Irreparable damage is done to the nursing profession when the press uses terms such as "angel of death" or "killer nurse." The authors conclude that the nature of the news industry is to constantly repeat the charges in headlines that ultimately hammer away at the image of nurses. They discuss strategies for nurses to balance out the horrifying stories with letters to the editor or news items that focus on truly caring vignettes of nursing that often go unnoticed.

Ann Jones, author of *Women Who Kill*, analyzed the Michigan case against two Filipino nurses and noted many racist and sexist overtones to the FBI's investigation and trial tactics.[23] The Registered Nurses Association of Ontario noted that during the Canadian investigation, nurses were subjected to much more vigorous and condescending questioning than other health care providers. Not one doctor was questioned about giving babies an overdose of digoxin, but every nurse was. A dean and professor of nursing called the inquiry "the highest-paid, tax supported case of a sexual harassment exercise that we've ever seen."[24]

Evidentiary Issues

Both direct and circumstantial evidence have been used against nurses in these trials. Gathering

evidence has been time consuming and very costly. In spite of the epidemiologic studies and expert testimony, less than half of the nurses charged have been convicted, and two convictions have been overturned on procedural grounds.[25] A review of the cases that resulted in convictions shows that prosecutors need direct and indirect evidence to pursue a murder or assault conviction.

Confessions

While confessions are certainly persuasive, they are easily challenged. The attorneys for the nurse in Maryland successfully barred admission of her written confession. The nurse explained that she had been detained for almost 48 hours without food or sleep, although the police claimed to have offered her food which she refused. She believed she would be detained until she agreed to sign a confession, and she experienced gastric upset from drinking caffeinated drinks. The court ruled that the confession was obtained under the taint of an illegal detention.[26]

Another attorney very creatively challenged the Georgia nurse's confession on grounds of her mental condition. This particular nurse had been molested as a child by her adoptive father after her mother's death. She suffered memory lapses and was diagnosed as having a dissociative disorder as a result of the childhood trauma. The nurse's attorney argued that she was accustomed to being accused of doing things for which she had no memory. She had learned that it angered people for her to deny what she appeared to have done, so she acquiesced and generally agreed with any accusations. Thus, when confronted by the Georgia Bureau of Investigation with evidence that she had injected patients and caused cardiac arrests, she broke down and said she had not meant to harm anyone—she claimed she felt sorry for those patients and was just trying to help them. The attorney was unsuccessful in overturning the admissibility of her confession. She was ultimately found guilty but mentally ill.[27]

Toxicological Reports and Statistics

All of the cases have used some form of toxicological data. In some cases, immediate post-cardiac-arrest blood studies were done. In others, autopsies included toxicologic analysis for the presence of certain drugs. In the most extreme cases, bodies that had been buried for months were exhumed and key organs were sent to highly specialized laboratories for drug assays. When this type of evidence is introduced, it can be refuted on the grounds that almost no large-scale studies regarding postmortem drug metabolites have been done.[28] Another problem with postmortem analysis is the reality that many drugs may elude detection by standard measures.

The evidentiary problems with statistics have been discussed above. Generally, epidemiologic data can be very useful to help carry the burden of proof, but it has not been enough to obtain a conviction if there is no direct evidence of murder.

Eyewitness Accounts

In the Michigan case, a patient reported feeling funny after one of the nurse defendants injected something into his intravenous line. The witness died prior to the appeal. In some cases, other nurses have testified to seeing a defendant nurse in close proximity to the patient immediately preceding a cardiac arrest, or seeing the nurse be the first on the scene of a code blue. Once the nurse in Alabama was investigated and charged, patients came forward with reports of frightening experiences that resulted in codes while these patients were under that nurse's care.[29] In the New York nurse's case, a patient who survived a cardiac arrest made a compelling witness as he pointed out the nurse who injected him.

In the Texas case, a pediatrician provided critical testimony regarding the defendant nurse's reaction to finding needle holes in the vial of Anectine. She testified that the nurse said "let's just throw the vial out." She also described the nurse's behavior when children suffered breathing failures immediately after receiving routine immunizations. The nurse would get very excited and would bark orders at emergency personnel during the code and transport to the hospital.[30]

Search and Seizure

In the California case, a search warrant was obtained to search the nurse suspect's home. Vials of lidocaine, the suspected agent, were found among his things.[31] In general, however, searches of defendants' homes have not proven to be very productive. Implementing a tight surveillance protocol in the hospital was very effective in the Georgia case. Once increased cardiac arrests were noticed over a one-month period, the hospital implemented the following measures:

1. Potassium chloride (the substance found in patients' blood following cardiac arrests) was made a controlled substance (i.e., nurses had to sign and account for each cc).
2. Every patient who had a cardiac arrest had EKG monitor strips preserved and had blood analysis for toxic substances.
3. The quality assurance department carefully observed for trends in patient outcomes on the intensive care unit where the epidemic occurred.
4. The CDC study showed one nurse's presence correlated with the majority of codes. Without raising the staff nurse's suspicions, that nurse was watched particularly closely.

During three months of the surveillance protocol, no further unusual codes occurred. The month after the protocol was discontinued, the suspected nurse hung blood on a patient who immediately went into a cardiac arrest. He was resuscitated and the IV tubing was found to have toxic amounts of potassium chloride. The nurse was charged with murder and assault. She was convicted of one assault. She was not convicted of murder, as the direct evidence

was clear only for the last incident and that patient survived.[32]

Implications for Nursing

Although the incidence of nurse-associated epidemics is extremely rare, nurses who wonder whether a colleague might be involved in adverse patient outcomes need guidance. First, nurses should objectively document any suspicious incidents. A nurse who suspects that clusters of codes are occurring should request a consultation by risk management or quality assurance personnel. It is not prudent to jump to conclusions based on rumor or innuendo. Epidemics can be traced to many causes, including faulty equipment, infectious agents, or bad batches of medication.

Second, if a particular nurse's behavior causes concern, documentation is critical. Nurses should document bizarre verbal exchanges. These can be used as evidence. If there is an increase in adverse incidents, surveillance should include documenting personnel present before and during codes, post-cardiac-arrest blood studies, saving and counting all syringes and vials of medication, and maintaining EKG strips on patients. In extreme cases, video monitoring can provide excellent evidence of wrongdoing.[33]

Georgia recently conducted an investigation of a nurse who worked at a variety of hospitals and for a float pool. The nurse was ultimately convicted of murder when he moved to Alabama. Families of several patients who had been in his care filed a lawsuit against 20 metropolitan hospitals based on a conspiracy theory. The complaint alleged that the hospitals had deliberately failed to conduct appropriate reference checks before employing this nurse. Although he had been fired from four hospitals with a "do not rehire" in his file, this information was not communicated when he applied for new jobs. The plaintiffs further alleged that a conspiracy of silence existed due to the shortage of qualified nurses. Most hospitals simply asked for proof of licensure and two friendly references.[34] The suit was ultimately dropped (conspiracy is difficult to prove). However, the message is clear: Background checks must be thorough, and providers of information have a duty to communicate objective data regarding a nurse's termination. Fear of liability for providing defamatory reference information is a poor justification for allowing questionable health care providers to continue to practice. A civil rights lawsuit for providing damaging reference information can be successfully defended if the information shared is truthful and nondiscriminatory. The costs of such a lawsuit are minimal compared to the multimillion-dollar damages that can arise out of negligent hiring of a nurse with an unsafe record.

The 12 cases studied here provide important information that can be used by employers. The nurses who were convicted of murder had prior histories of falsifying information. This included exaggerating their credentials, falsifying medical records, and falsifying personal and

family information. Any falsification by a nurse should be considered extremely serious by employers. In at least three of the cases, the nurses reportedly suffered from Münchhausen syndrome. The tendency to induce illness in oneself is a predisposing factor to developing Münchhausen syndrome by proxy, or inducing illness in dependents under one's care. Nurses should be educated regarding the warning signs of Münchhausen syndrome. Employers need to have job descriptions specifying that any person with a psychological condition related to giving false information does not meet the occupational qualifications for the position. Such a policy is consistent with the protection afforded individuals in the Americans with Disabilities Act.[35]

Conclusion

The extremely rare cases of nurses accused of murder have unfortunately tainted the media portrayal of our profession. We must respond to the negative images in the news with positive ones. Pointing out exaggerations and hysteria by the news media can mitigate the damage done by sensational stories. Previous cases have demonstrated how organized nursing groups can be advocates if nurses are victimized in murder investigations. At the same time, it is imperative that we, as a profession, continue to uphold the standards of practice and ensure patient safety, even if it means stopping an unsafe nurse from practice.

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Serial Murder by Healthcare Professionals

ABSTRACT: The prosecution of Charles Cullen, a nurse who killed at least 40 patients over a 16-year period, highlights the need to better understand the phenomenon of serial murder by healthcare professionals. The authors conducted a LexisNexis® search which yielded 90 criminal prosecutions of healthcare providers that met inclusion criteria for serial murder of patients. In addition we reviewed epidemiologic studies, toxicology evidence, and court transcripts, to provide data on healthcare professionals who have been prosecuted between 1970 and 2006. Fifty-four of the 90 have been convicted; 45 for serial murder, four for attempted murder, and five pled guilty to lesser charges. Twenty-four more have been indicted and are either awaiting trial or the outcome has not been published. The other 12 prosecutions had a variety of legal outcomes. Injection was the main method used by healthcare killers followed by suffocation, poisoning, and tampering with equipment. Prosecutions were reported from 20 countries with 40% taking place in the United States. Nursing personnel comprised 86% of the healthcare providers prosecuted; physicians 12%, and 2% were allied health professionals. The number of patient deaths that resulted in a murder conviction is 317 and the number of suspicious patient deaths attributed to the 54 convicted caregivers is 2113. These numbers are disturbing and demand that systemic changes in tracking adverse patient incidents associated with presence of a specific healthcare provider be implemented. Hiring practices must shift away from preventing wrongful discharge or denial of employment lawsuits to protecting patients from employees who kill.

KEYWORDS: forensic science, serial murder, homicide, assault, healthcare professionals, epidemics, nurse, murder

Serial murder by healthcare professionals is a poorly understood but increasingly identified phenomenon (1). The highly publicized cases of Harold Shipman (2,3) the British physician labeled "the most prolific serial killer in the history of the United Kingdom—and probably the world." ((2), p. 1843) after 218 patient deaths were attributed to his lethal administration of Diamorphine (diacetylmorphine), and Charles Cullen (4), a registered nurse (RN) who confessed to killing at least 40 patients in nine hospitals and one nursing home over a 16-year period in two different States, raise many questions about how some of these murderers could get away with killing patients for so long.

The literature to date includes five epidemiologic studies used in the prosecution of nurses for serial murder (5–9), and editorials in the *New England Journal of Medicine* (10) and the *British Medical Journal* (2,11) that address the shock experienced by the healthcare profession when a colleague is convicted of serial murder of patients. Articles by Yorker (12–14), Forrest (15), Beine (16), and Stark (17,18) have identified some common themes in the cases of serial murder by healthcare providers. For example, an investigation often begins when a cluster of cardiopulmonary arrests and/or deaths occurs in a particular patient population. In some cases, suspicions are aroused because patients suffer multiple cardiopulmonary arrests and the resuscitation rate is unusually high. The typical scenario in the cases in the literature involves presence of a common injectable substance in postmortem, or postevent toxicology screens, deaths that cluster on the evening or night shift, and epidemiologic studies linking presence of a specific care provider to increased likelihood of death (15,19). Forrest coined the term caregiver associated serial killings (CASKs) to label the phenomenon (15).

This review of 90 prosecutions is based on the first four author's personal experience with some of the cases and their shared view that data about this phenomenon needs to be disseminated to heighten awareness that serial murder of patients is a significant concern that extends beyond a few shocking, isolated incidents. In addition, we promote strategies for early detection, successful prosecution, and prevention of these crimes that undermine the public's confidence in the safety of healthcare.

Methods

The authors conducted a LexisNexis® (New York, NY) search to compile a list of healthcare professionals formally charged with murder of patients in their care. LexisNexis® is an advanced legal library database with access to news media and case law. When available, we also reviewed court transcripts, depositions, audio and video tapes, pleadings, toxicology evidence, and government documents.

Initial searches of the database resulted in 147 cases of healthcare providers charged with murder. We excluded: (A) murders committed by healthcare providers outside of the caregiver/patient relationship, e.g., domestic violence, date rape/murder, or associated with motives of revenge, jealousy, or self-defense; (B) murder outside a healthcare setting with firearms, bludgeoning, or other violent means; (C) single murders of patients committed by healthcare providers in a healthcare setting; (D) instances of assisted suicide, such as Dr. Jack Kervorkian who was charged with murder or manslaughter on multiple occasions for killing patients who had provided full informed consent for life termination; and (E) the occasional physician or nurse who is charged with euthanasia for administering lethal amounts of narcotic analgesics to a

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terminally ill patient deemed to be suffering intractable pain. We excluded the recent investigations regarding deaths of hospital and nursing home patients in the wake of Hurricane Katrina as the healthcare providers involved were operating under extraordinary circumstances outside the realm of every day healthcare decision making.

We did however include some cases in which the convicted healthcare provider claimed to be engaged in euthanasia as a defense against murder charges. To differentiate between *authentic euthanasia* and *serial murder*, we correlated the provider's justification of their actions as euthanasia with patient histories. If a caregiver claimed he/or she was engaging in euthanasia, but the victims had been admitted for routine procedures (e.g., biopsy, immunizations, minor injuries, etc.) and postmortem examinations indicated they died from toxic levels of an unauthorized medication, we considered it a case of murder. For example, Charles Cullen initially stated that he was only killing very sick patients to alleviate pain and suffering (4), however, when the medical records of his victims were reviewed, it became apparent that patients who were lethally injected with digoxin were not necessarily terminally ill—e.g., one of his victims was in the hospital recovering from a choking episode. Similarly, Stephan Letter claimed to be sparing patients from senseless suffering, however he allegedly injected a 22-year-old German soldier hospitalized after a minor injury. Fortunately, she only lost consciousness briefly and recovered (20). Several victims of other healthcare providers in this study were killed shortly before being discharged to home or transferred to another care unit (16).

The data presented is limited to those prosecutions of healthcare professionals that fit the literature on serial murder in healthcare, specifically, those cases that linked clusters of suspicious cardiopulmonary arrests and deaths in a patient population to presence of a specific care provider. The total number of healthcare providers who met inclusion criteria of formal legal prosecution for serial murder of patients in their care is 90. We analyzed the data according to geographic location, healthcare provider type, gender, healthcare setting, method of murder, number of patients involved, and outcome of legal proceedings. Some caregivers qualified for more than one category (e.g., geographic location, method and healthcare setting), increasing the numbers to greater than 90 on some variables. Names of healthcare providers are included for most of the prosecutions because they were obtained from documents in the public domain. Some demographic data is missing from the published accounts of prosecutions.

Results

Legal Outcomes

Forty-five of the 90 healthcare providers were convicted for serial murder (Table 1) four were convicted for attempted murder/assault (Table 2), and five pled guilty to lesser charges (Table 3) totaling 54 convictions. Twenty-four more have been indicted for serial murder and are either awaiting trial or the outcome of the investigation has not been published (Table 4). Another eight were charged with serial murder, however there was insufficient evidence to convict (Table 5). In three of those cases, civil suits resulted in payments of $8 million, $450,000 and $27 million for wrongful death of multiple patients. Four more nurses successfully appealed their convictions for serial murder (Table 6).

TABLE 1—*Convicted for serial murder of patients.*

	Town, Country	Area of Work/Method	Year	Charges, Conviction, #Suspicious Deaths
Europe nurses/aids				
1. Rudi Paul Zimmerman	Noordrijn, Wuppertal, Germany	Nurse, hospital and nursing home Elderly	1971–1976	Convicted for 3 murders, 4 attempts and serious abuse. Life sentence
2. Frans H.	Kerkrade, Holland	Nurse, Psych-geriatrics	1972–1976	Convicted for 5 murders, 259 susp. deaths, confessed, 2 life sentences
3. Reinhard Böse	Rheinfelden, Germany	Nurse, ICU. Hosp.	1975–1981	Convicted of 7 murders, sentenced to 7 years
4. Cecile Bombeek	Wetteren Belgium	Nurse/Nun Hosp.	1977	Convicted for murder 3+pts.15 suspected. After conviction immediately admitted in psych hosp.
5. Arnfinn N. Nesset	Trontheim, Norway	Nurse, Nsg. home succinylcholine	1977–1981	Convicted of 22 murders, 138 suspected, sentenced to 21 years
6. Waltraud Wagner, co-defendant of colleague	Lainz, Vienna Austria	Aide, hospital Rohypnol Water in lungs	1983–1991	Convicted of 15 murders, 17 attempts. murd. 135 susp. murders. Life sentence, confessed
7. Irene Leidolf (Ilene) co-defendant of colleague	Lainz, Vienna Austria	Aide, hospital Rohypnol Water in lungs	1983–1991	Charged with 4 murders, 2 accomplice to murder charges, suspected of at least 65 murders. Convicted of 5 murders, confessed, life sentence
8. Michaela Roeder	Wuppertal, W. Germany	Nurse, ICU. Hosp. KCl	1985–1989	Convicted of 5 murders, 1 attempt. murd Confessed. 11 years sentence
9. Wolfgang Lange	Gutersloh, Germany	Nurse, hosp. Neuro psychiatry Air embolus	1990–1993	14 susp. murd. Convicted of 9 murders, 15 years sentence
10. Beverley Allitt	Grantham, England	Nurse, peds, hosp. KCl Insulin Suff. Air embolus	1991–1993	Convicted of 4 murders, 3 attempted murders, 6 assaults, 13 life sentences
11. Female aide	Keulen, Germany	Aide, home	1993–1998	Convicted of 6 murders, Life sentence
12. Martha U.	Delfzijl, Holland	Practical nurse, Nursing home	1996	Charged and convicted of 4 murders. Sentenced to 4 years,+Psychiatric treatment. Suspected of 5 murders
13. Lucia de Berk	The Hague, Holland	Nurse, peds & adult floor, hosp. ICU Morphine/digoxin	1997–2002	Convicted of 7 murders, 3 attempted murders. 7 suspected murders, 2 suspected attempted murders. Life sentence
14. Christine Malevre	Versailles, France	Nurse, neurology. Hosp. KCl, morphine	1998	Charged with 7 murders, convicted of 6 murders. 24 suspected murders. 12 years sentence
15. Barbara Patricia Salisbury	Crewe, England	Nurse, geriatrics, floor, hosp. Morphine, suffocation	1999–2004	Charged with 2 murders, 2 attempted murders. Convicted of 2 attempted murders, 5 years sentence. Conviction upheld on appeal

TABLE 1—*Continued.*

	Town, Country	Area of Work/Method	Year	Charges, Conviction, #Suspicious Deaths
16. Roger Andermatt	Lucerne, Switzerland	Nurse, nsg. home Suffocation/meds	2001	Charged with 22 murders, 5 attempted murders, confessed. Convicted. Life sentence
17. Timea Faludi,	Budapest, Hungary	Nurse, hosp. terminally ill unit Morphine/drugs	2001	Charged with 7 murders, 37 susp. Murd. Confessed, 11 years sentence
18. Olaf Dater	Bremerhaven, Germany	Nurse, private care	2001	Charged w/5 murders, 1 attempted murder. Confessed. Convicted. Life sentence
19. Michaele G.	Wachtberg, Germany	Practical nurse, Nursing home suffocation	2003	Convicted of 4 murders, 4 manslaughters, 1 killing on demand. Life sentence
20. Benjamin Geen	Banbury, England	Nurse/ER. Hosp. "unexplained respiratory problems"	2004	Sentenced on 2 counts of murder, and 15 counts of causing grievous bodily harm
Europe physicians				
21. Harold Shipman	Hyde, England	Physician, hosp, own practice, Nsg home, morphine	1974–2001	Convicted of 15 murders. 218+susp. murders. Life sentence. Hangs himself in prison 2004
United States nurses/aids				
22. Genene Jones	Kerrville, TX, U.S.A.	Practical nurse, hosp. ICU, out pt. Anectine, coumadin	1981–1984	Charged with 1 murder, 6 attempted murder. 27 susp. Convicted of 1 murder & 1 assault. Sentenced to 159 years
23. David Richard Diaz	CA, U.S.A.	Nurse, ICU, hosp. lidocaine	1981	Convicted of 12 murders 27 susp. murd. Death penalty
24. Bobbie Sue Terrell	Woodlawn, Illinois & FL, U.S.A.	Nurse, Nsg. Home. Insulin, suffocation.	1984–1985	Charged with 4 murders, 12 suspected murders, Confessed. Sentenced to 65 years
25. Otha Harrison Hart	Eugene OR, U.S.A.	Nurse, geriatrics Insulin	1984	Charged & convicted of 4 murders. 20 years per conviction
26. Randy Powers	CA, U.S.A.	Aide, hosp. Lidocaine	1984	Convicted of 1 murder. 12 suspected murders
27. Gwendolyn Gail Graham, co-defendant of C.M. Wood	Grand Rapids, MI, U.S.A.	Aide, Nursing home. Suffocation	1986–1988	Convicted of 5 murders, 1 conspiracy to murder, Life
28. Catherine May Wood, co-defendant of G.G. Graham	Grand Rapids, MI, U.S.A.	Aide Nursing home. Suffocation	1986–1988	Pled guilty to 6 susp. Murders. Convicted, sentenced to 20–40 years
29. Donald Harvey	Cincinnati, OH, U.S.A.	Aide, Hosp. Insulin, cyanide, suffocation, equip.	1987	Pled guilty to 24 murders, admitted to 74 murders. Convicted 3 life sentences
30. Richard Angelo	West Islip, Long Island, NY, U.S.A.	Nurse, ICU. Hosp. Pavulon	1987–1989	Convicted of 4 murders, 7 susp. murders, 3 susp. attempt. murd., 50 years sent., confessed
31. Charles Cullen	New Jersey, PA, U.S.A.	Nurse, ICU, hosp. nsg. home Digoxin	1987–2003	Charged with murd., 2 attempted murd. 40 suspected murders. Confessed to 13. Sentenced to 11 life sentences
32. Jeffrey Feltner	FL, U.S.A.	Aide, Nursing home Suffocation	1990	Pled guilty to 6 murders. Convicted. Life sentence
33. Brian Kevin Rosenfeld	FL, Largo U.S.A.	Nurse, Nsg. home, Mellaril	1991–1992	Pled guilty to 3 murders, 23 susp. murders. Confessed. Life sentence
34. Joseph Dewey Akin	AL, U.S.A.	Nurse, hosp. Float Epinephrine, KCl	1992–1997	Convicted 1murd. 100 susp. murders, 20 susp. attempt. murders. Life
35. Orville Lynn Majors	Clinton, IN, U.S.A.	Practical nurse, ICU, floor, KCl	1993–1999	Charged with 7 murders, 124 susp. Convicted of 6 murders, 360 years
36. Aleata Beach	OK, U.S.A.	Practical nurse hospital	1994	Charged for 4 murders, confessed. Sentence unknown
37. Kristen Gilbert	Northampton, MA, U.S.A.	Nurse, ICU. Hosp. VA Epinephrine	1995–1996	Charged with 4 murd., 1 manslaughter, and 2 attempts. murd., 37 susp. murd. Convicted of 4 murders, 2 life sent. Life sentence
38. Susan Hey	Austin, TX, U.S.A.	Nurse/hospital KCl	1997	Convicted 2 susp. murders, confessed, 2 terms of 50 years
39. Jeanine Hannah/Miata	TX, U.S.A.	Home health care aide, Insulin	2000–2005	Charged & convicted of 1 count of murder & 1 count of injury. Suspected in one additional case. Sentenced to 99 years
40. Vickie Dawn Jackson	TX, U.S.A.	Vocational nurse, VA Hosp. Mivacron		Pled no contest to 10 murders. 23 susp. murders
United States physicians				
41. Joseph Michael Swango	Illinois, NY, U.S.A. Zimbabwe	Physician, hosp, home KCl	1970 2000	Charged with 5 murders, indicted for 1 murder, 1 attempt., 126 susp. deaths in several countries. Confessed 2 life sentences
United States respiratory therapist				
42. Efren Saldivar	Glendale, CA, U.S.A.	Resp. therapist Hosp. Pavulon, morphine	1989 1998	Pled guilty of 6 murd. 165 susp. murd. 1suspected attempt. murd. Convicted. Six life sentences+15 years
Other countries nurses				
43. Aida Noureddin Mohammed Abu Zeid	Alexandria, Egypt	Nurse, neuro. Surg. ICU hosp. Resp. paralyzing agent	1998	Convicted of 1 murder, 29 attempted murders, Sentence reduced to 1 manslaughter and 13 unintentional injuries. 10 years hard labor
44. Edson Isidora Guimaraes	Rio de Janeriro, Brazil	Aide, ICU. Hosp.	1999	Charged w/4 murders, 127 suspected murders. Confessed. Convicted 76 years
45. Daisuke Mori	Sendai, Japan	Practical nurse, hosp. muscle relaxant	2001	Charged with 1 murder. 4 attempt murd. 20 susp. deaths Confessed. Life sentence

TABLE 2—*Charged with serial murder, convicted of attempted murder or assault.*

1. Maria Gruber co-defendant of colleague	Lainz, Vienna Austria	Aide, hospital meds, suffocation	1983–1991	Charged with 2 murders, convicted of 2 attempted murders, 15 years sentence
2. Stephanie Maier (Stephanija) co-defendant of colleague	Lainz, Vienna Austria	Aide, hospital meds suffocation	1983–1991	Charged with 12 murders, 24 accomplice to murder. Convicted of 7 attempts. Confessed. 20 years sentence
3. Terri Rachals	Albany, GA, U.S.A.	Nurse, ICU. Hosp. KCL	1985–1986	Charged with 6 murd. 20 assault. 10 susp. murd. Convicted for 1 assault, guilty but mentally ill, served 17 years, released 2002
4. Phillip Reed	Leeds, England	Nurse, hosp. nsg. home, morphine	1999–2000	Charged with 2 murders, 2 poisonings, and 4 charges mistreating patients. Convicted 4 years for assault

Cases Each Decade Since 1970

Ten CASKs took place during the 1970s, 21 during the 1980s, 23 during the 1990s, and 40 since 2000 (four of these spanned more than one decade). The number of new investigations in the United States has slowed somewhat (two in the 1970s, 12 in the 1980s, 11 in the 1990s, and 10 between 2000 and 2006) while 30 of the investigations since 2000 occurred in other countries.

Geographic Location

The United States conducted 36 prosecutions, or 40%. Twenty-two states have prosecuted cases, with Texas, Michigan, California, Florida, and Indiana having three or more. Twenty-one countries have prosecuted caregivers for serial murder of patients with Germany (14 cases) and England/Wales (12 cases) experiencing the highest number of cases (Fig. 1). It is noteworthy that the vast majority of prosecutions to date have occurred in countries with technologically advanced healthcare. Some caregivers account for more than one geographic location, e.g., Charles Cullen was investigated in Pennsylvania and New Jersey, and Joseph Michael Swango, a physician, was investigated and prosecuted for murders and poisonings in New York, Illinois, then Zimbabwe before finally being sentenced to life in prison (21).

Profession

Nursing personnel comprise the overwhelming majority (86%) of serial healthcare killers (Fig. 2). RNs were the most frequent type of healthcare professional involved, accounting for 54 of the 90 prosecutions. Seven were either Licensed Practical Nurses (LPNs) or Licensed Vocational Nurses (LVNs) and 16 were nurses' aides. Two physicians and one respiratory therapist have been convicted for serial murder. An additional seven physicians are awaiting trial (six in murder for profit schemes) and two were acquitted. One medical technician was acquitted of murder, but found liable for $27 million in damages (Table 5).

Gender/Ethnicity

Women comprise almost half (49%) of the convicted serial killers in Table 1, however 55% of the total number of prosecuted healthcare providers whose gender was known were female. Males are disproportionately represented among the prosecuted nurses. A national survey of RNs found 6% are male (22), yet 44% of the RNs prosecuted for murder were male. Figure 3 shows the gender breakdown for each professional group. Of the known racial background, the overwhelming majority, 94%, of the prosecuted caregivers are Caucasian. Figure 1 shows the breakdown by country, which provides some insight regarding ethnicity.

Healthcare Setting

The distribution of the 90 prosecutions by healthcare setting is shown in Fig. 4. The vast majority of clusters of patient deaths occurred in hospitals. The type of hospital units represented is also summarized in Fig. 4. Some healthcare providers were charged with killing patients in more than one setting, e.g., Genene Jones was associated with a cluster of deaths in a pediatric intensive care unit, and later in a pediatrician's outpatient clinic, and Charles Cullen worked in hospitals and a nursing home. The majority of hospital killings occurred on the night or evening shifts. Several killers were first suspected of killing in a hospital, and after their hospital employment was terminated (often precipitated by the investigation into suspicious deaths) the perpetrator moved to another setting and continued to kill.

Victims

Patients who were critically ill, very old, very young, or otherwise vulnerable were most likely to be victims of serial murder. However, quite a few victims were ambulatory with intact cognitive capacity, showing that no patient is immune to a serial healthcare killer. Taking only the most conservative figures from actual convictions for murder, assault, and guilty pleas (Tables 1–3) there were a total of 328 patients whose deaths resulted in a prison or death sentence for the 54 convicted healthcare providers. There were an additional 130 convictions for assault, or attempted murder, of patients who suffered cardiopulmonary arrests and sometimes permanent brain injury, at the hands of these caregivers but were resuscitated. The number of convictions is about 15% of the total number of patient deaths and assaults attributed to these

TABLE 3—*Charged with serial murder, pled guilty to lesser charges.*

1. Neil Hartley	Rochdale, England	Nurse Hosp. Pethidine, Haldol, narcotics	1998	Charged w/1 murder. Pled guilty to 6 charges of unauthorized administration of drugs, 1 years suspended License withdrawn
2. Rhea R. Henson	VA, U.S.A.	Nurse, coronary care unit CCU Morphine	2000	Charged with 2 murders, pled guilty to distribution of a controlled substance
3. John Walter Bardgett	Bedford, NH, U.S.A.	Nurse, nursing home	2001–2003	2–*x* manslaughter, 4-x attempt. Murder, confessed unauthorized adm. of med., conviction unknown
4. Peggy S. Couse	Marion, IN, U.S.A.	Nurse, nursing home	2002–2004	Suspected of involvement 4 suspect. deaths, confessed unauthorized adm. of drugs
5. Coleen M. Thompson	Rockville, MD, U.S.A.	Nurse, ICU	2003	Charged with hastening death of 5 patients, 211 suspicious deaths, pled guilty to criminal neglect

TABLE 4—*Charged with serial murder—trial pending or outcome unknown.*

Name	Town, Country	Profession Area of Work/ Method	Year	Charged w/Murder, Trail Pending or Outcome Unknown
1. Cheryl May	Fort Wayne, IN, U.S.A.	Nurse, nursing home	1999	1 *x* murder, 5 susp. murders, conviction unknown
2. Name Unknown	Slough, England	Health care assistant, Nrsg home, hosp.	2000	Suspected of involvement in the deaths of 4 children
3. Sebastian Fontaine	Boornik, Belgium	Nurse, hosp.	2001	Suspected of 6 murders
4. Name Unknown	Nurnberg, Furth, Germany	Aide, elderly home	2002	Suspected of 2 attempted murders
5. Name Unknown	Rheinstetten, Germany	Aide, home care	2002	Suspected of 10 attempted murders
6. Noreen Mulholland	Leeds, England	Nurse, general fl. Hosp. Insulin	2002	Arrested, charged for 2 deaths 18 suspicious deaths
7. Mechthild Bach	Hannover, Langenhagen, Germany	Physician Internal medicine Hosp. Morphine	2002–2004	Inquiry into 76 susp. murders, 8 charges of manslaughter
8. Heather Clowe	Dublin, Ireland	Nurse, poison	2003	Charged with 2 counts of assault, 2 counts of administering a harmful substance
9. Francine Brunfaut	Brussell, Belgium	Vocational aide, elderly home	2004	Suspected of 2-19 murders
10. Female Nurse	Hemel Hempstead, England	Nurse/hosp. Medical equip	2004	Arrested on suspicion of 1 murder and attempting to kill 3 other patients
11. Sonia Caleffi	Lecco, Italy	Nurse/hospital Shots w/air-filled needles	2004	Arrested on suspicion of 5 deaths
12. Anne Grigg-Booth	Keighley, England	Nurse/hosp. morphine, pethidine & heroin	2004–2005	Charged with 3 counts of murder, 1 charge of attempted murder & 13 counts of unauthorized administration of noxious substances Died at home while awaiting trial
13. Doris B.	Straubing, Germany	Nurse/hospital. Morphine	2005	Charged w/manslaughter. Arrested, charged on suspicion of killing 7 patients
14. Male Nurse	Leeds, England	Nurse/hospital Insulin	2002–2005	Charged with four murders one attempted murder, trial scheduled for 2007
15. Stephan Letter	Sonthofen, Germany	Nurse Injection drug combination	2004–2005	Charged with 16 murders and 12 manslaughter, 1 add'l killing and 2 assaults 70+suspicious deaths
16. Female	Tuttlingen, Germany	Nurse Succinylcholine	2005	Charged with 10 deaths
Serial murder for profit	Town, Country	Area of Work/Method	Year	Charges
17. Male Nurse	Lodz, Poland	ER Hospital various medications	2004	Charged with 5 deaths in order to receive payment from funeral parlor. Up to 5000 deaths suspected
18. Male Nurse	Lodz, Poland	ER Hospital various medications	2004	Charged with 5 deaths in order to receive payment from funeral parlor. Up to 5000 deaths suspected
19. Male Physician	Lodz, Poland	ER Hospital failure to provide life saving care	2004	Charged with 5 deaths in order to receive payment from funeral parlor. Up to 5000 deaths suspected
20. Male Physician	Lodz, Poland	ER Hospital failure to provide life saving care	2004	Charged with 5 deaths in order to receive payment from funeral parlor. Up to 5000 deaths suspected
21. Pyor Piyatnichuk	Moscow, Russia	Physician induced coma	2004	Charged with aggravated murder of multiple patients in organ transplant market
22. Bairma Shagdurova	Moscow, Russia	Physician induced coma	2004	Charged with aggravated murder of multiple patients in organ transplant market
23. Irina Lirstman	Moscow, Russia	Physician induced coma	2004	Charged with aggravated murder of multiple patients in organ transplant market
24. Lyudmilla Pravdenko	Moscow, Russia	Physician induced coma	2004	Charged with aggravated murder of multiple patients in organ transplant market

54 caregivers because obtaining evidence of "guilt beyond a reasonable doubt" on all suspicious deaths is not cost-effective. A very alarming statistic is the total number of victims. At least 2113 patients died suspiciously while in the care of a convicted healthcare provider. If we consider the numbers of pending charges against healthcare providers there are an additional 80 murder charges and 26 assault charges, with an additional 242 suspected victims, excluding the up to 5000 deaths that may be associated with murder for payment by a funeral parlor in Poland (Table 4).

Methods of Murder and Assault

Several healthcare providers used more than one method to kill patients. For example, Beverly Allitt injected insulin, potassium chloride, and air, as well as suffocation (23). Figure 5 summarizes the methods used. While the method of killing patients is not specified in 25 cases, at least 51 healthcare providers used injection, 12 used suffocation, followed by drowning, air embolus, oral medications, tampering with equipment, and poisoning. Licensed nurses (RNs, LPNs, and LVNs) in North America typically injected nonnarcotic medications (e.g., epinephrine, insulin, or potassium chloride) into intravenous lines. In Europe, nurses more often used morphine. Among the other medications used were concentrated neuromuscular paralyzing agents such as succinylcholine (Anectine) or Pavulon (Pancuronium) and cardiac medications such as digoxin or Lidocaine.

Nurses' aides tended to use alternate methods, such as suffocation, or use of oral medications or poisons. In Austria, four nurses' aides engaged in a form of so-called oral hygiene that involved pouring water down the patient's throat to drown them (14,16). Some nurses' aides also injected medications; however,

TABLE 5—*Charged with serial murder—acquitted/civil suit damages.*

Name	Town, Country	Area of Work/Method	Year	Charges, Conviction, Appeal
1. Nurse A.	Toronto, Canada	Nurse, neonatal ICU and peds. unit digoxin injection	1981	18 suspicious deaths of infants, charged with 4 counts of murder, 6 counts of assault. The wrong nurse was arrested. No charges were brought against Nurse A, the nurse associated with the deaths by the CDC study
2. Jane Bolding	Prince George's County, Maryland	Nurse, ICU KCl	1983–1984	17 suspected murders, 23 suspected attempted murders, acquitted after prosecution's case $8 million in damages paid for wrongful death claims
3. Michael Beckelic	Maxwell AFB AL, U.S.A.	Med. tech. Lidocaine	1988	21 suspected murders & 11 attempted murders. $27 million in civil damages for injecting 9 infants
4. Richard Williams	Columbia, MO, U.S.A.	Nurse, V.A. Hosp. Succinylcholine	1992–2003	10 counts of first-degree murder. Liable for $450,000 in wrongful death charges. 41 suspicious deaths. Charges dropped due to new science raising questions regarding toxicology results
5. Thomas K.	Berlin, Germany	Nurse, ICU. Hosp.	1996	Charged with 5 counts manslaughter, unaccountable for actions. Admitted to psychiatry
6. Michael Coons	Portland, OR, U.S.A.	Nurse, Nsg. home, Morphine	1998	Charged with 4 murders 1 attempted murder. Was not indicted, deemed psychiatrically ill
7. Howard Martin	Conway Wales	Physician G.P. Diamorphine	2004	Charged with 3 murders, acquitted of 3, several more being investigated
8. Avola Humphreys	Bodawen, Wales	Nurse/nursing home	2005	Charged 1 count manslaughter and 7 assault charges, acquitted

this was done surreptitiously, as aides are not authorized to administer medications (Fig. 6).

Motives

Insufficient information was available to systematically analyze the motives behind these murders, however, the literature review, case studies, and confessions of a few of the killers provide some insight regarding motives.

Often, authorities begin investigating serial murder in healthcare settings when they notice a significant increase in the number of cardiopulmonary arrests on a particular unit. If the number of successful resuscitations is higher than expected, this increases suspicion of caregiver-induced arrests. Such a finding raises the possibility that the killer may be seeking secondary gain from the cardiopulmonary arrests and may have had a primary objective of simply causing a code, rather than murder. For example, the prosecutor in the trial of Benjamin Green claims that he injected patients with respiratory paralyzing agents for "the excitement of trying to revive them" (24). Kristen Gilbert, a RN convicted of four murders with 37 suspicious deaths, was having an extramarital affair with a security guard who worked the evening shift at the same hospital. The hospital's protocol required that security be called to all cardiopulmonary arrests. The epidemiological data showed that suspicious codes only occurred when both she and her paramour were on duty (25). Likewise, Richard Angelo, a nurse in New York, admitted he injected patients with Pavulon® (Organon, USA, Roseland, NJ) because of the respect and admiration he got from his colleagues for performing well in a code. During his confession, he likened himself to volunteer firefighters who set fires (14). This motive of secondary gain, or excitement has been labeled a professional version of Munchausen Syndrome by Proxy (MSBP), a psychiatric disorder in which a primary caregiver induces a health crisis in his/her child for the purposes of getting medical attention (1). Professor Roy Meadow, who coined the term, testified at Beverly Allitt's trial regarding MSBP as a possible motive (23). Several nurse serial killers had histories of injecting themselves, or otherwise making themselves ill (Munchausen Syndrome) and Beine's study of European nurses showed several suffered from *psuedologica fantastica* and hypochondria (16). Many of the convicted healthcare providers had falsified their credentials and/or had fabricated critical events (e.g., fire, sexual assault, bomb threat) before being suspected of murdering patients (1).

In contrast to the above, some caregivers simply seemed to get sadistic satisfaction from killing certain types of patients. Colleagues of Orville Lynn Majors testified that they could predict which patients would die while under his care. Patients who were demanding, whiny, or disproportionately added to his workload were at risk. One nurse testified at his trial that she was afraid to

TABLE 6—*Successfully appealed convicted for serial murder.*

Name	Town, Country	Area of Work/Method	Year	Charges, Conviction, Appeal
1. Filipina Narciso	Ann Arbor, Michigan	Nurse V.A. Hospital med surgical floor, injection, Pavulon	1975	Convicted of 1 murder, 3 assaults. 10 suspicious deaths. Appealed, conviction set aside
2. Leonora Perez	Ann Arbor, Michigan	Nurse V.A. Hospital med surgical floor, injection, Pavulon	1975	Convicted of 1 murder, 3 assaults. 10 suspicious deaths. Appealed, conviction set aside
3. Jesse McTavish	Scotland	Nurse Geriatric unit, insulin injection	1974	Convicted of 1 count of murder, 4 counts of assault, 23 suspicious deaths. Appealed and conviction overturned
4. Robert Allen Weitzel	Layton Utah, TX, U.S.A.	MD/psychiatrist Psychogeriatrics Morphine	2000–2002	Convicted of 5 murders, 2 manslaughter, 3 negligent homicides, Sentenced to 15 years. Judge overturned conviction based on procedural error. Charged with prescription drug fraud, convicted and sentenced 1 year for fraud. Recharged for felony manslaughter and negligent homicide

US State	# Cases
Alabama:	2
California:	3
Florida:	3
Georgia:	1
Illinois:	1
Indiana:	3
Maryland:	2
Massachusetts:	1
Michigan:	4
Missouri:	1
New Hampshire	1
New Jersey	1
New York:	2
Oklahoma:	1
Ohio:	1
Oregon:	2
Pennsylvania:	1
Texas:	5
Virginia:	1
Total (19)	**36**

Country	# Cases
Austria:	4
Belgium:	3
Brazil:	1
Canada:	1
England/Wales:	12
Egypt:	1
France:	1
Germany:	14
Holland:	3
Hungary:	1
Ireland:	1
Italy	1
Japan:	1
Norway:	1
Poland:	4
Russia:	4
Scotland:	1
Switzerland:	1
United States:	36
Zimbabwe:	1
Total (20)	**93**

FIG. 1—*Geographic location.*

go to lunch if she had to temporarily assign her patients to him because she noticed that previously stable patients would collapse while under his care (26). Similar comments from coworkers emerged during the investigation of Barbara Salisbury. However, her defense claimed a different motive; that the pressure of a heavy workload and needing to free up beds in order to admit new patients contributed to her hastening the death of her most ill patients (27). An additional profit motive is suggested in the prosecutions of two nurses and six physicians who apparently worked as teams charged with murder of patients for payment from a funeral parlor, or from an organ transplant market.

Toxicology

Toxicology evidence can be invaluable in prosecuting healthcare killings. In the conviction of Terri Rachels, postcardiac arrest blood analysis revealed significantly elevated levels of potassium. After one of her patients suffered a cardiac arrest, officials sent the tubing she had used to administer a unit of blood to the lab and

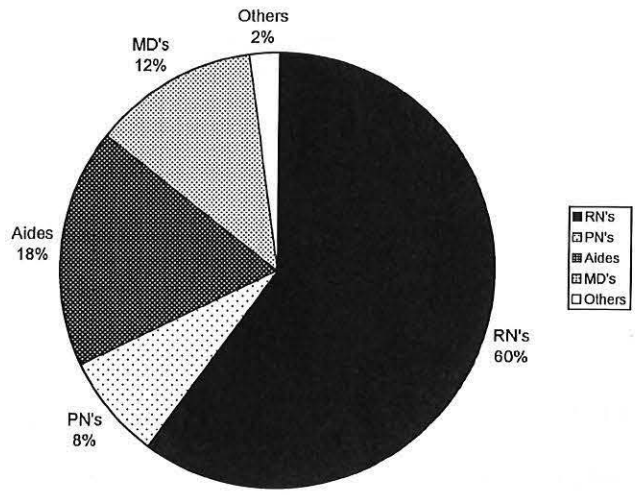

FIG. 2—*Professions.*

found highly concentrated potassium chloride present in the tubing. This evidence was instrumental in obtaining a conviction for assault as the patient was successfully resuscitated. That said, many investigations for murder rely on postmortem, or even postexhumation toxicological studies, which are analytically challenging, are searching for rapidly degraded drugs, or both. For example, a fatal overdose of intravenous potassium chloride is impossible to detect on analysis of postmortem blood, as after death there is a rapid increase in both serum and vitreous humor potassium (28). However, a contemporary or retrospective analysis of samples collected during a cardiac arrest can reveal unexpected hyperkalemia. The retrieval of syringes with traces of concentrated potassium chloride solution, and DNA consistent with that of the victim's, can be compelling evidence.

The identification of hypoglycemia induced by administering exogenous insulin is also problematic. The triad of low blood glucose, high serum insulin, and low C-peptide is not necessarily specific for insulin overdose (29,30).

The interpretation of postmortem toxicological findings is, at best, difficult (31); however, the finding of a drug in high concentration in the body of a patient for whom it had never been prescribed makes compelling evidence of at least a serious medical error, if not a crime. Such evidence led to murder convictions in several instances.

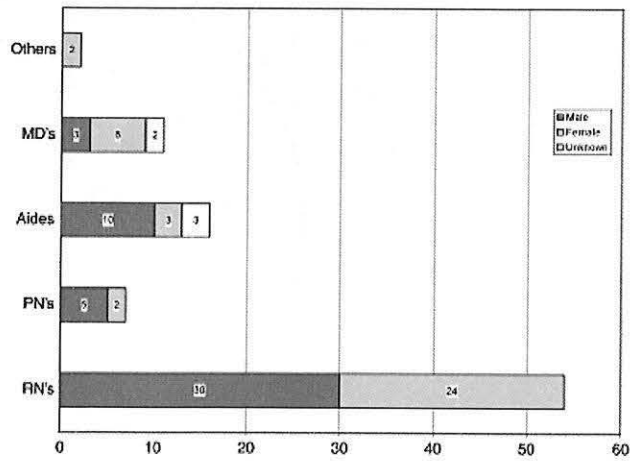

FIG. 3—*Gender.*

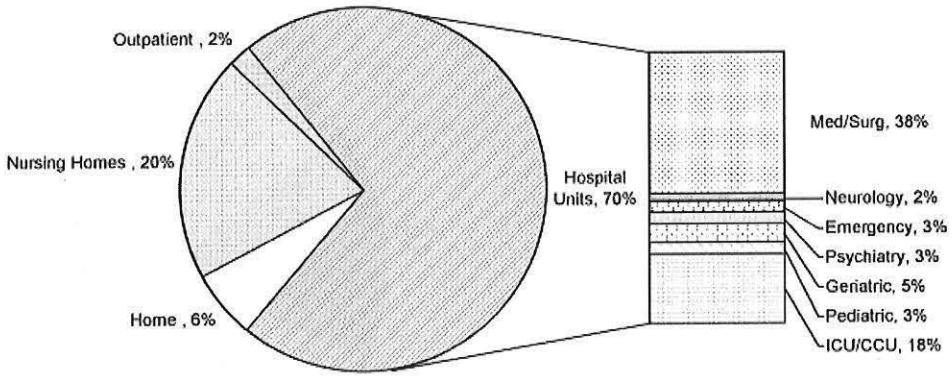

FIG. 4—*Healthcare settings.*

Legal Outcomes

The burden of proof in a murder trial, as in all criminal trials in Common Law-based jurisdictions, is guilt beyond a reasonable doubt. That is to say, the trier of fact, or prosecutor, has to be sure of the accused's guilt. "*Sure*" means the level of certainty that the prosecutor would apply in every day life when he/she wanted to be absolutely certain of some fact or circumstance. This high standard is not met by simply having a statistical correlation. English courts, for example, have rightly expressed reservations about the judicially perceived misuse of statistical evidence (32). Successful prosecutions have relied on having an array of supporting evidence, including confessions, positive toxicology results, and eyewitness accounts, such as a family member who testified that the nurse injected the patient just before the patient's collapse. Prosecutors searched the home and belongings of several nurses in the investigations described here. Vials of the suspected agent(s), needles, syringes, and hospital records found in nurses' homes were later introduced as evidence.

Statistics alone have proven quite problematic, although when combined with other evidence they can be quite useful. During the trail of a nurse in Maryland, an epidemiologist testified for the prosecution that one nurse was 57 times more likely to have patients die in her care than all other evening shift nurses (19). The judge ruled this finding insufficient to prove guilt of murder. However, the same evidence may be used in a civil suit for wrongful death or malpractice, as occurred in the Maryland case which resulted in $8 million in civil damages, because in those proceedings there is need to only show a preponderance of the evidence—i.e., the trier of fact only has to be sure by slightly over 50% that the evidence favors the plaintiff's case. Similarly, the case involving Michael Beckelic had insufficient evidence to show guilt beyond a reasonable doubt, but civil suits against him resulted in $27 million in awards to the families of nine infants he was charged with injecting.

Intervention and Prevention

While the information available in this study did not allow for a thorough assessment of the opportunities for intervention and prevention, several observations seem relevant based on the data collected. The frequency with which hospitals were the site of healthcare murder prosecutions most likely reflects several things, including easy access to injectable medications, availability of patients with intravenous lines, reduced oversight during evening and night shifts, the frequent use of float nursing personnel, and less than routine quality assurance activities that may increase the

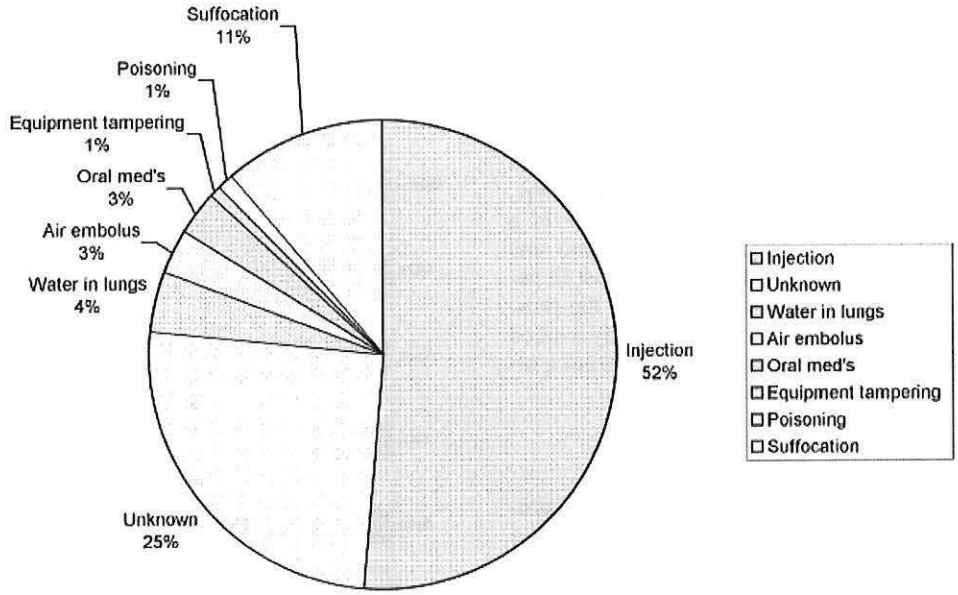

FIG. 5—*Methods.*

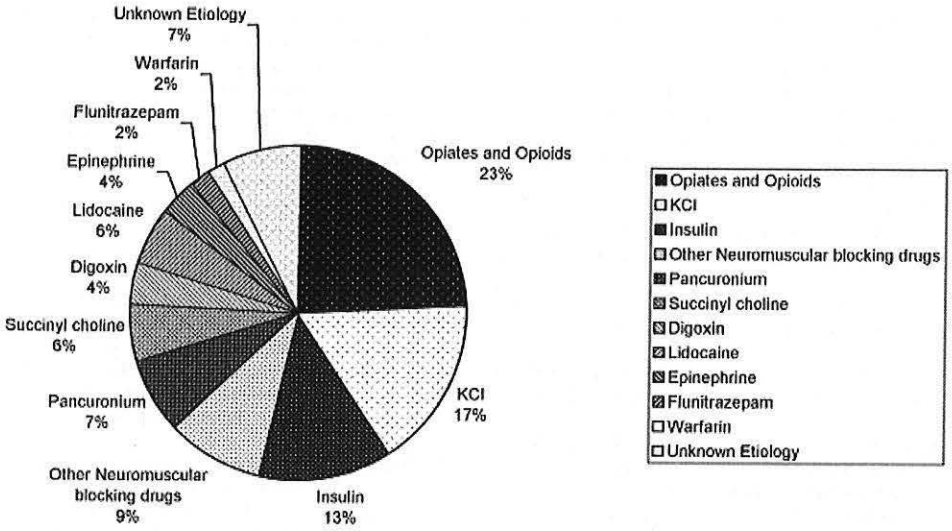

FIG. 6—*Drugs used.*

likelihood of these crimes going undetected. Current practices that allow licensed practitioners easy access to noncontrolled, potentially lethal injection medications with typically little accountability for use of such medications is one area that should be carefully considered for ways to prevent the occurrence of healthcare-related serial murder.

Of particular interest was the observation that while very few of the killers had a criminal record, many of them had histories of falsifying their credentials or other aspects of their background. Such falsifications were often not picked up during the hiring process, and in cases when they were known about, did not seem to present a significant barrier to hiring. The propensity to engage in fraud or fabrication of significant information is consistent with sociopathic traits and with Munchausen Syndrome (1). Healthcare employers should consider any fraud or misrepresentation a serious risk factor.

Clearly, hospital hiring practices vary, and today, they may be significantly influenced by the widespread shortage of nurses. At present, risk management approaches seem to favor policies geared toward preventing lawsuits for wrongful termination, denial of employment, or defamation. While such suits can be successfully defended against if truthful information regarding job performance is given, the cost of defending an employment rights lawsuit is often several hundred thousand dollars. Unfortunately, this cost appears to have influenced current risk management policies. Less well appreciated seems to be the fact that the cost of hiring a serial killer, even if not criminally convicted, can result in multimillion dollar civil suit verdicts for negligent hiring and wrongful deaths. A better balance is needed between the employment rights of caregivers and the ability of healthcare facilities to know about the backgrounds of employees. We encourage healthcare employers to be forthcoming with references that include information that a healthcare worker was fired, or to provide information regarding adverse patient outcomes associated with the presence of a particular caregiver.

Case study data showed that in some instances hospital administrators and physicians were uncooperative with prosecutors in their investigations—usually simply by stonewalling the investigators, but in two cases actually obstructing the investigation. The reasons cited for being uncooperative included fear of negative publicity, fear of civil suits for negligence, fear of civil suits by nurses being investigated, and poor record keeping. For example, in the case of Orville Lynn Majors, the hospital's death review committee, which was supposed to meet monthly, had met one time during the year that was the focus of the investigation (26).

In contrast, in the Georgia prosecution, hospital administrators worked so effectively with law enforcement that the epidemic lasted only 3 months—the shortest of the suspicious epidemics documented in this series. A surveillance protocol set up in collaboration with the Georgia Bureau of Investigation deterred further suspicious cardiac arrests and allowed solid evidence to be collected that led to a conviction. The investigation occurred discretely without concerns of a "witch hunt" or civil rights violations that have often plagued these prosecutions. Healthcare employers should provide an atmosphere that facilitates staff reporting of concerns about patient safety or criminal behavior. Such an approach is consistent with efforts to promote the nonpunitive environment that is needed to promote patient safety and healthcare error reporting.

This review of prosecutions of serial murder by healthcare providers underscores the need to raise awareness of this phenomenon; to routinely gather epidemiologic, toxicologic, and psychological data about such occurrences; and to ensure policies and procedures that achieve a balance between protecting employee rights and ensuring patient safety. Current practices that allow licensed practitioners easy access to noncontrolled, otherwise therapeutic medications should be examined, and procedural safeguard designed to track injectable dosing. The violation of trust and training that occurs when the skills designed to provide safety are used to harm patients makes serial murder by healthcare providers a particularly heinous crime.

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SMHP Spreadsheet Convictions

Name	Sex	Country, City	Age at Discovery	Profession, Area of Work	Method	Year of Discovery	Duration suspected	Charges	Conviction	Acquitted/ dropped	Details
Elizabeth Wetllaufer	F	Canada, Ontario	49	RN, Caressant Care nursing home	inj. Insulin	2016	2007-2014	2017: life in prison for 8x murder, 4x attempted m, 2x aggravated assault			confessed, remorseful
Garry Steven Davis	M	Australia, Newcastle	29	aged care worker, SummitCare Wallsend aged care facility	inj. Insulin	2016	2013	2016: charged and sentenced 40 yrs for 2x murder + 1 attempted m.			launched appeal in 2017
Hayato Imai	M	Japan, Yokohama	23	care worker, Kawasaki nursing home	threw 3 victims off balconies	2016	2014	2016: charged with 3x murder, 2018: convicted, death penalty			confessed then recanted
Ivo Poppe	M	Belgium, Bruges	61	RN, Roman Catholic deacon, clinic in Menin	inj. air into veins	2014	1980s-90s	2014: charged murder 10x, 2018: convicted murder 5x, 27 yrs in jail			called "Deacon of Death" admitted to 10-20 killings
Megan Haines	F	Australia, Balina	49	RN, St.Andrews Village Nursing Home	inj. Insulin	2014	2014	2014: Charged 2x murders, 1 assault,	2016: convicted, 36 year sentence		
Regina K	F	Germany, München	33	Midwife, maternity clinic	Injecting heparin (blood thinner) prior to c-sections	2014		2016: convicted 7-9x attempted murder, 2x grievous bodily harm/ 15 year sentence			
Victorino Chua	M	Great Britain, Manchester	48	RN, Stepping Hill Hospital in Stockport	insulin poisoning, tampering of saline bags	2014	2011-2014	2015: charged and convicted 2x murder and 31 other charges re: poisoning of patients. 35 yrs before parole. 2017: appeal denied			wrote 13 pg letter "Angel turned evil"
Roger Kingsley Dean	M	Australia, Sydney	35	RN, Quackers Hill Nursing Home	arson	2011		2013 life, no parole, for 11x murder + 8 grievous bodily harm + theft			Caused a fire 7 hours atfer police interview abt theft of medication

SMHP Spreadsheet Convictions

Angela Almore	F	USA, Chappel Hill, NC	50	RN Alzheimer's Unit	Injected unauthorized opiates	2010	2010	Indicted for 1 murder, 6 assaults, pled guilty, sentenced to < 1 year	involuntary manslaughter, patient abuse		14 patients tested positive for opiates that weren't ordered, one died, 6 more resp. problems, Said she wanted to keep them quiet.
Angelo Stazzi	M	Italy, Rome (Tivoli)	65	Alex Sant Angelo Romano-nursing home (RN?)	inj. Insulin	2010		2010: 24 yr for murder on ex-female friend and colleague. 2014: murder 7 patients			
Joan Vila	M	Spain, Olot	45	Geriatric help, La Caritat	bleach, acid, combination of drugs	2010		2013: 127 yrs prison for 11 murders			Would have liked that someone had ended his suffering
Kermit Gosnell	M	USA, Pennsylvania, Philadelphia	69	MD, Women's Medical Society clinic in Philadelphia	used scissors to kill 7 babies in botched abortions, women died from surgery	2010	1980-2010	2011: charged 8x murder, 2013: convicted 3x murder, 1x involuntary manslaughter, sentenced to life without parole			performed illegal late term abortions, violated all health codes
Aino Nykopp-Koski	F	Finland, Helsinki	50	RN, Various hosp., nursing homes and home care	inj, sedatives, opiates and insulin	2009		Charged: 5 x murder, 6 attempt.murd. + aggrav. assaults +theft. Life for 5 x murder + 5 attempt.murd.			appeal denied in 2011
Bianca D	F	Germany, Dresden	32	RN, Dresden-Neustadt, hosp., geriatr.		2009		Charged: 2 x murder, 3 attempt.murd. Life for 1 x murd., (adoptive mother) 2 attempt.murd. (patients)			Suspect of more murd. in the priv. domain. Outcome appeal?
Kimberly Saenz	F	USA, Texas, Lufkin		LVN, DaVita dialysis Centre	inj. Bleach	2008		April 2012, life for 5 x murder, 5 x aggravated assault			History of turbulent employment. Killed 3 in one day

SMHP Spreadsheet Convictions

Katariina (Catherine) Pantila (Loennqvist)	F	Finland, Ylöjärvi /Tampere	26	RN	1x causing † infant during family gathering + 1 x pat. In Ylinen Rehabilitation Facility., inj. insulin	2007		Charge 1 x murder,1 x attempt.murd., 2 x aggrav. assaults. Life for 1 x murder + 1 x attempt. murder			Found dead in prison cell in 2010
Kurt Dobbelaere	M	Belgium, Ghent	43	RN supervisor, elderly nursing home	inj. Insulin	2007		Charged: 4 x murder + 1 x attempt. murd. Life for same			
Petr Zelenka	M	Czech Republic, Havlickuv Brod	30	RN, elderly nursing home	inj. insulin	2007		Life for 7 x murd., 10 x attempt. murd.			Mandatory compens. of $160,000 USD
Rachel Baker	F	Great Britain, Butleigh, Somerset	44	RN supervisor, residential care	Injecting Tramadol	2007		2x murd	2010: 10 yrs for 1 manslaughter, 10x poss of drugs, 1x perverting course of justice	only of one murder, others stuck	Stole painkillers to control her migraine attacks. Whistle-blower awarded
Hans M.	M	Germany, Köln		RN, Klinikum Holweide.	inj. KCL, Susp. involvement In 25 †	2006		no data found on internet			
Irene Becker	F	Germany, Berlin	53	RN, Charité hosp., I.C	inj. Nitroprussid-natrium, Dormicum	2006		Charged: 6 x murd., 1 x attempt. murd. + grievous bodily harm. Life for 5 x murder,1 x attempt. murd. + griev.bod. harm			
Abraão José Bueno	M	Brazil, Rio de Janeiro	27	Aide, (nurse tech)UFRJ/ IPPMG hospital, child.ward	inj. Fenobarbi- tal, midazolam, curare	2005		Charged: for 4 x murder and 4 x attempt. murd.	110 yr. for 4 x murder + 4 x attempt.		appeal denied in 2011
Chislain Dusart	M	Belgium, Boutersem	53	Occupational Therapist, Nursing home, Van Roosbeek, Vondelhof	inj. insulin	2005		Charged 1 x murder. 21 yrs. for 1 x manslaughter			Behaved like (& called himself) a doctor
Niels Högel	M	Germany, Oldenburg +Delmenhorst	38	RN, ICU Gilurytmal (Ajmaline)	lidocaine, calcium chloride cardiac drugs tempering equipment, creating resussitations	2005	1999-2005	2005: 5 yr, + 8 months prison for 1 x murder. 2015: life in prison for more. 2018: charged with 97 more			possibly 200 + murders

SMHP Spreadsheet Convictions

Benjamin Green	M	Great Britain, Banbury	28	RN, Horton General Hospital	casualty., inj. insulin, vecuronium, midazolam	2004	2003-2004	Charged: 2 x murder, 18 x griev. bod. harm, 18 x giving unauthor. med. 17 x	life for 2 murder and 15 attemp. Murders	Lost appeal in 2009. Case in 2010 reviewed by Criminal Cases Review Commission, outcome ? 2015- 2 jurors now believe innocent
Margarete G.	F	Germany, München	58	Aide, home care	inj. opiates + suffoc.	2004		Life for 1 x murder 1		
Stephan Letter	M	Germany, Sonthofen	25	RN, hospital, internal med	Inj. Lysthe-non, mida-zolam, eto-midat, suc-cenylcholine, partly inj. as cocktail	2004		16 x murd., 13 x mansl.	Life sentence for 12 x murd. 15 x mansl.	Mother suff. from Munchhausen by Proxy: Stephan being the victim
Mechthild Bach	F	Germany, Hannover-Langenhagen	53	Dr., oncologist Parcelsusklinik, hosp.	i.v. morphine cocktail, Diazepam	2003		13x manslaughter	2011: at least 2 murders	after trial committed suicide
Noreen Mulholland	F	Ireland, Kildare	35	RN, Naas General Hospital	inj. Haloperidol w/extreme force, poisoning, assault	2003		2 assaults, 1 poisoning	found guilty, 10 years total. Sentence adjourned into 5 yr. probation	traumatising childh. incl. sex. ab. Given psych. Treatm. Instead
Sonia Caleffi	F	Italy, Lecco	38	RN, Several hosp. incl.'Manzoni'	inj. air into veins	2003		12 x murder, 3 attempt. murd.	20 years + paying fin. comp. for 5 x murd. + 3 attempt. murd.	30 susp murd., history of turbulent employmet
Andrzej N	M	Poland, Lodz	35	Paramedic, ambulance crew		2002		5x murder	4-5x murder, life sentence	Receiving cash for corpses delivered to funeral-homes
Colin Norris	M	England, Leeds	26	RN, hospital orthopaedics	insulin	2002		4 x murder, 1 x attempt. murd	life sentence for same, minimum 30 yrs	jurors now think innocent, Review Commission now considering appeal
Janusz K	M	Poland, Lodz		Dr., hosp. ER	failure to provide life saving care	2002		5x murder	5-6 yr. for neglecting care leading to 14 deaths	Receiving cash for corpses delivered to funeral-homes
Karol B	M	Poland, Lodz	37	Paramedic, ambulance crew	pavulon inj.	2002		5x murder	25 yr for 1x lethal inj.	Receiving cash for corpses delivered to funeral-homes

SMHP Spreadsheet Convictions

Pawel W	M	Poland, Lodz		Dr., hosp. ER	failure to provide life saving care	2002	5x murder	5-6 yr. for neglecting care leading to 14 deaths	Receiving cash for corpses delivered to funeral-homes
Unnamed aide		Germany, Rheinstetten	31	Aide, home care	inj. Insulin	2002	10x attempt. murd.	15 yr. for 1 x mansl. + 6 attempted murd. + griev. bod. harm	
Olaf Däter	M	Germany, Bremerhaven	31	RN, Home care	suffocation with pillow	2001	5 murds, 1 attempted murd	5 murd, 1 attempt. Murd. Life sentence	
Sebastien Fontaine	M	Belgium, Doornik	31	RN, La Dorcas, hosp.	inj. KCL, oxygen and witholding medicine	2001	3 murders	3 yrs prison, 5 yr probation for 1 murd	6-10 susp murders
Maxim Petrov	M	Russia, St. Petersburg	35	GP, home visits	inject. cocktail of drugs	2000	Charged: 17 x murder.	Life for 12 x murd. + 19 susp. murd.	
Alfonso De Martino	M	Italy, Albano Laziale		Ospedale San Guiseppe + home care.	Citrosil (detergent) + pavulon	1993	1995: life for murder 4x		Believed in occultism. Wearing devil images. Predicting deaths precisely. Nickname: Infermiere Satanista
Antoio Busnelli	M	Italy, Milan	50	nurse, Fatebenefratelli hospital, ICU	Isoptin, (vasodilator)	1992		1993: 28 yr prison for multiple attemp. murder + 2 murders	Financial compensation from funeral agency. Seemed to have also helped with preparation of remains
Marianne Nolle	F	Germany, Cologne	56	aide, home care	orally (?) Truxal (chlorprothixen)	1991	Murder: 17x, Attempted M: 18x, life for 7 murders		
Aida Noureddin Mohammed Abu Zeid	F	Egypt, Alexandria		RN, neuro. Surg. ICU, hosp.	resp. paralyzing agent	1998	1 murder, 29 attempted murders	sentence reduced to 1 manslaughter, 13 unintentional injuries	sent. 10 yrs hard labor
Arnfinn N. Nesset	M	Trontheim		RN, Nursing Home	succinylcholine	1977-1981		22 murders, 21 years	138 susp.

SMHP Spreadsheet Convictions

Barbara Patricia Salisbury	F	England, Crewe	RN, geriatrics, floor, hosp.	morphine, suffocation	1999-2004	2 murd., 2 attempted murd.	2 attempted murd, 5 yr sent.	conviction upheld on appeal
Beverley Allitt	F	England, Grantham	RN, peds, hosp	KCl, insulin suff. Air embolus	1991-1993		4 murd., 3 attempt, 6 assault. 13 life sentences	
Bobbie Sue Terrell	M	USA, FL & Illinois, Woodlawn	RN, nsg. Home	insulin, suffocation	1984-1985	4 murd	4 murd, confessed, 65 yr sent.	12 susp. Murd.
Brian Kevin Rosenfeld	M	USA, FL, Largo	RN, Nsg. Home	Mellaril	1991-1992	3 murders	3 murders, confessed	23 susp murd., life sentence
Catherine May Wood, co-defendant of G.G. Graham	F	USA, MI, Grand Rapids	Aide, nsg. Home	suffocation	1986-1988		6 susp. Murd., 20-40 yr sent.	
Cecile Bombeck	M	Belgium, Wetteren	RN/Nun Hosp.		1977		3 murders	15 susp. Admitted into psych hosp after conviction
Charles Cullen	M	USA, PA, New Jersey	RN, ICU, hosp, nsg. Home	Digoxin	1987-2003	1 murd, 2 attempted murd	confessed to 13 murders, 11 life sentences	40 susp. Murd
Christine Malevre	F	France, Versailles	RN, neurology, hosp.	KCl, morphine	1998	7 murd.	6 murd., 12 yrs sent.	24 murd susp.
Coleen M Thompson	F	USA, MD, Rockville	RN, ICU		2003	5x hastening death in patients	criminal neglect	211 susp deaths
Daisuke Mori	M	Japan, Sendai	RN, practical nurse, hosp.	muscle relaxant	2001	1 murd, 4 attempt murd	1 murd, 4 attempt murd.	20 susp murd, life sentence
David Richard Diaz	M	USA, CA	RN, ICU, hosp.	lidocaine	1981		12 murd, death penalty	27 susp. Murd.
Donald Harvey	M	USA, OH, Cincinnati	Aide, hosp	insulin, cyanide, suffocation, equip	1987		24 murd, plead guilty. 74 murd. Admitted to.	got 3 life sentences
Edson Isidora Guimaraes	M	Brazil, Rio de Janeiro	Aide, ICU. Hosp		1999	4 murders, confessed to 5 murd	4 murders, sent. 76 yrs	susp 131 murd
Efren Saldivar	M	USA, CA, Glendale	Resp. Therapist, Hosp	Pavulon, morphine	1989-1998	6 murders	6 murders, pled guilty, 6 life sent. + 15 yrs	165 susp murd, 1 susp attempted
Frans H.	M	Holland, Kerkrade	RN, psych-geriatrics		1972-1976		5 murders, confessed, 2 life sentences	259 susp. Deaths
Genene Jones	F	USA, Texas, Kerrville	RN, practical nurse, hosp. ICU, out pt.	Anectine, coumadin	1981-1984	1 murd, 6 attempted murd.	1 murd, 1 assault, 159 yr sent.	27 susp. Murd.

SMHP Spreadsheet Convictions

Gwendolyn Gail Graham, co=defendant of C.M. Wood	F	USA, MI, Grand Rapids		Aide, nsg. Home	suffocation	1986-1988		5 murd, 1 conspiracy to murder, life sent.		
Harold Shipman	M	England, Hyde		Dr., hosp., own practice, Nsg home	morphine	1974-2001		15 murders, life sentence		218+ susp murders, hung himself in prison
Irene Leidolf (Ilene), co-defendant of colleague	F	Vienna Austria, Lainz		Aide, hosp	water in lung, Rohyphol	1983-1991	4 murders, 2 accomplice to murder	5 murders, confessed, life sentence		65+ susp. Murd
Jeanine Hanna/Miata	F	USA, TX		Aide, home care	insulin	2000-2005	1 murd, 1 count of injury	1 murd, 1 injury, 99 yr sent.		2 susp. Murd.
Jeffrey Feltner	M	USA, Florida		Aide, Nursing home	suffocation	1990	6 murders	6 murd, pled guilty		life sentence
John Walter Bardgett	M	USA, NH, Bedford		RN, Nursing Home	morphine	2001-2003	2x manslaughter, 4x attempted murd	unauthorized admin of med, sent. 24 mo in jail, revoked license	yes	acquitted of murder and manslaughter
Joseph Dewey Akin	M	USA, AL		RN, hosp. float, KCl	epinephrine	1992-1997		1 murder, life sentence		100 susp. Murd, 20 susp. Attempt murders.
Joseph Michael Swango	M	USA, NY, Illinois; Zimbabwe		Dr., hosp., home KCl	poisoning, overprescription	1970-2000	5 murders, indicted for 1 murd, 1 attempt	1 murder, 1 attempt, 2 life sent.		126 susp deaths in several countries
Kristen Gilbert	F	USA, MA, Northampton		RN, ICU. Hosp. VA	epinephrine	1995-1996	4 murd, 1 manslaughter, 2 attempted murd.	4 murd, 2 life sentences		37 susp. Murd.
Maria Gruber co-defendant of colleague	F	Vienna Austria, Lainz		Aide, Hosp	water in lung, Rohyphol	1983-1991	2 murders	2 attempted murd, 15 yr sent.		200 susp. Murd.
Martha U.	F	Holland, Delfzijl		RN, practical nurse, nursing home		1996	4 murd	4 murd, sent. 4 yrs + psychiatric treatment		5 murd susp.
Michaela Giersberg	M	Germany, Wachtberg	27	RN, practical nurse, nursing home	suffocation	2003		4 murd, 4 manslaughters, 1 killing on demand.		life sentence
Michaela Roeder	F	Germany, Wuppertal		RN, ICU. Hosp.	KCl	1985-1989		5 murders, 1 attempt. Murd, confessed, 11 yr sent.		

SMHP Spreadsheet Convictions

Neil Hartley	M	England, Rochdale	RN, hosp.	pethidine, haldol, narcotics	1998	1 murder	6x unauthorized admin of drugs, 1 yr suspended	license withdrawn
Olaf Dater	M	Germany, Bremerhaven	RN, private care		2001	5 murd., 1 attempted murd.	5 murd, 1 attempt. confessed, life sentence	
Orville Lynn Majors	M	USA, IN, Clinton	RN, practical nurse, ICU, floor, KCI		1993-1999	7 murd.	6 murd, 360 yr sentence	124 susp. Murders
Otha Harrison Hunt		USA, OR, Eugene	RN, geriatrics.	insulin	1984	4 murd	4 murd, 80 yr sent.	
Peggy S Couse	F	USA, IN, Marion	RN, Nursing Home		2002-2004	4 susp. Murders	unauthorized adm of med	
Phillip Reed	M	England, Leeds	RN, hosp, nsg. Home	morphine	1999-2000	2 murd, 2 poisonings, 4x mistreating patients	4 yrs for assault	
Randy Powers	M	USA, CA	Aide, hosp	lidocaine	1984		1 murd	12 susp. Murd.
Reinhard Bose	M	Germany, Rheinfelden	RN, ICU, Hosp.		1975-1981		7 murders, 7 years sentence	
Rhea R Henson	F	USA, VA	RN, coronary care unit Ccu	morphine	2000	2 murders	distribution of a controlled substance	
Richard Angelo	M	USA, NY, Long Island, west islip	RN, ICU. Hosp.	Pavulon	1987-1989		4 murd, 50 yr sent.	7 susp murd., 3 susp. Attempted murd.
Roger Andermatt	M	Switzerland, Lucerne	RN, nsg. Home	suffocation, meds	2001	22 murders, 5 attempted murd	22 murd, 5 attempted. confessed, life sentence	
Rudi Paul Zimmerman	M	Germany, Noordrijn, Wuppertal	RN, hospital and nursing home elderly		1971-1976		3 murders, 4 attempts and serious abuse	life sentence
Stephanie Mayer (Stephanija Maier)	F	Vienna Austria, Lainz	Aide, Hosp	water in lung, Rohyphol	1983-1991	12 murders, 24 accomplice to murder	7 attempted murd, 20 yr sent	200 susp. Murd.
Susan Hey	F	USA, TX, Austin	RN, Hospital KCI		1997		2 murders, sentenced to 2 terms of 50 yrs	confessed
Terri Rachals	F	USA, GA, Albany	RN, ICU, Hosp	inject potassium chloride	1985-1986	6 murd, 20x aggravated assault	1 aggravated assault, 17 yr sent.	declared guilty but mentally ill. Realeased in 2003
Timea Faludi	F	Hungary, Budapest	RN, hosp. terminally ill unit	morphine, drugs	2001	7 murd.	confessed, 11 yrs sentence	37 murd susp.

SMHP Spreadsheet Convictions

Unnamed aide	F	Germany, Keulen	aide, home care		1993-1998		6 murders, life sentence	
Vickie Dawn Jackson	F	USA, TX	RN, vocational nurse, VA Hosp	mivacron	2000-2001	10 murders	10 murders, plead no contest	23 susp murders, 5 susp attempts
Waltraud Wagner, co-defendant of colleague	F	Vienna Austria, Lainz	Aide, Hosp	water in lung, Rohyphol	1983-1991		15 murders, 17 attempted murd., life sentence, confessed	200 susp. Murd.
Wolfgang Lange	M	Germany, Gutersloh	RN, hosp. Neuro psych	air embolus	1990-1993		9 murders, 15 yr sent.	14 susp. Murd

SMHP Spreadsheet Cases appealed/acquitted/dropped

Name	Sex	Country, City	Age at Discovery	Profession, Area of Work	Method	Year of Discovery	Duration suspected	Charges	Conviction	Acquitted/ dropped	Details
Jesse McTavish	M	Scotland		RN, geriatric unit	insulin	1974		1x murd, 4x assault	convicted, successfully appealed	yes	23 susp deaths
Filipina Narciso	F	USA, MI, Ann Arbor		RN, VA Hosp. med surgical floor	inj. Pavulon	1975		1x murd, 3x assualt	convicted, successfully appealed	yes	
Leonara Perez	F	USA, MI, Ann Arbor		RN, VA Hosp. med surgical floor	inj. Pavulon	1975		1x murd, 3x assualt	convicted, successfully appealed	yes	
Nurse A.	F	Canada, Toronto		RN, neonatal ICU and peds	inj. Digoxin	1981		4x murder, 6x assault	charges dropped		18 susp infant deaths. Wrong nurse arrested. No charges brought ag. Nurse A, nurse associated w/deaths by the CDC study
Jane Bolding	F	USA, MD, Prince George's County		RN, ICU, KCl	potassium chloride	1985	1983-1984	3x murder, 2x attempt murd.		yes	17 susp murders, 23 susp attempted murd., acquitted. $8 million in damages paid for wrongful death claims
Michael Beckelic	M	USA, AL, Maxwell		Med Tech, Air Force Base	lidocaine	1988			charges dropped		21 susp murd, 11 attempt murd. $27 million in civil damages for injecting 9 infants
Aleata Beach	F	USA, OK		RN, practical nurse, hosp.	injecting air/ potassium chloride into veins	1994	1994	4 murders, confessed and attempted suicide	1995: case dropped for lack of evidence.	yes	confession ruled insufficient evi., families of deceased filed civil suit in 1995. outcome unknown
Thomas K	M	Germany, Berlin		RN, ICU, hosp		1996		5x manslaughter	unaccountable for actions		admitted to psychiatry
Cherly May	F	USA, IN, Fort Wayne		RN, Rehab Center	morphine.	1998	1998	1 murder, 6 susp murd	1999: charges dropped		
Michael Coons	M	USA, OR, Portland		RN, Nsg. Home	morphine	1998		4x murd, 1 attempted murd	not indicted		Deemed psychiatrically ill
Evelyn Brace	F	England, Slough		RN, hosp, children's ward		2001		susp involvement in death of 4 babies	no record of formal charges pressed		after preliminary investigation, no further news
Richard A. Williams	M	USA, MO, Columbia		RN, VA Hospital	succinylcholine	2002	1992	10x murder first degree	2003: charges dropped	yes	VA Hosp. liabile for $450,000 in wrongful death charges. 41 susp deaths. New science questioned toxicology results.
Unnamed Male	M	Germany, Nurnberg, Furth	23	Aide, elderly home	insulin	2002		susp. of overdosing 8 patients	no record of formal charges pressed		
Ann Grigg-Booth	F	England, Keighley		RN, senior night nurse, Airedale General Hosp.		2004		3x murder	2005: committed suicide awaiting trial		susp 15-20 murd
Bairma Shagdurov		Russia, Moscow		Dr., Moscow City Hospital		2004		2004 charged aggravated murd. of pat. in organ transplant marke		yes	2005 case acquitted. 2011 Supreme Court upheld 'not guilty' verdict

SMHP Spreadsheet Cases appealed/acquitted/dropped

Francine Brunfaut	F	Belgium, Brussel, Laken	60	volunteer, elderly home, Orally Diamox	3 x murder by poisoning. 19 suspected	2004	1999	2004: arrested 2012: case aquitted, lack of evidence		yes	
Howard Martin	M	Wales, Conway		GP	Overdosing Diamorphine	2004		2011: acquitted		yes	
Irina Lirstman	F	Russia, Moscow		Dr., Moscow City Hospital		2004		2004 charged aggravated murd. of pat. in organ transplant marke		yes	2005 case acquitted. 2011 Supreme Court upheld 'not guilty' verdict
Lyubov (Lyudmilla) Pravdenko		Russia, Moscow		Dr., Moscow City Hospital		2004		2004 charged aggravated murd. of pat. in organ transplant marke		yes	2005 case acquitted. 2011 Supreme Court upheld 'not guilty' verdict
Pyotr Pyatnichuk	M	Russia, Moscow		Dr., Moscow City Hospital		2004		2004 charged aggravated murd. of pat. in organ transplant marke		yes	2005 case acquitted. 2011 Supreme Court upheld 'not guilty' verdict
Roma Galvan	F	England, Hemel Hemstead	25	RN, ICU	insulin overdose	2004	2004	susp 1 murder, 3 attempt murders	charges dropped		2007: struck off nurse registry
Avola Humphreys	F	Wales, Bodawen		RN, nursing home		2005		1x manslaughter, 7x assault	acquitted	yes	
Cornelia / Conny V	F	Germany, Tuttlingen	42	RN, Tuttlinger Kreisklinik, IC	inj. Succenyl-choline	2005		2x murder, 6x grievous bodily harm	convicted in 2008	yes	2011: lack of evidence, case acquitted
Michael Fontana	M	USA, Texas, San Antonio		RN, Air Force Captain, Wilford Hall Medical Center	Charged killing 3-5 patients Opiate	2008		2009: aquitted by military court		yes	
Nicolas Bonnemaison	M	France, Bayonne	50	MD, Emergency room specialist	euthanasia, poisoning 7x	2011	2010-2011	2014: acquitted on 6 deaths		yes	Enormous support colleague workers. 2 yr. suspended sentence + 30.000 euro compensation † one pat. Reaction: attempted suicide
Ariel Acevedo	M	Uraguay, Montivideo	46	Aide, Hospital Maciel, Neuro. Surg. IC. CCU	Air embolus, unknown IV drugs	2012		Charged 15x murder, 14 yr. prison. Acquitted, lack of evidence		yes	w/ Marcelo confessed but said were pressed by police
Marcelo Pereira	M	Uraguay, Montivideo	40	Aide, Hospital Maciel, Neuro. Surg. IC. CCU	IV drugs, opiates	2012		charged 15x murder, 16 yr. prison. Acquitted, lack of evidence		yes	w/ Ariel confessed but said were pressed by police
Virginia Soares de Souza	F	Brazil, Curbita	55	MD,Head of ICU, Evangelical Hospital	prescribing medications and changing ventilation standards to clear beds 300 † suspected	2013	2011-2013	2013: charged with murder 7x, 2017: cleared of charges		yes	

SMHP Spreadsheet Cases appealed/acquitted/dropped

Daniela Poggiali	F	Italy, Ravenna	42	RN, Lugo di Romagna hospital, Gen Med ward	Potassium chloride in drip	2014		2016: life in prison for 1 murder, suspected of 38. 2017: acquitted and released- spent 3 years in jail		yes	took a smiling photo with a dead patient
Vera Maresova	F	Czech Republic, Rumburk	50	RN, Hospital, elderly patients ICU,	Injects Potassium Chloride directly into veins	2015	2010-2014	Arrested for 1 70 yo f, confessed to five more		Yes	Court said no evidence of crime, nurse compensated
Fausta Bonino	F	Italy, Piombino	55	RN, ICU		2016		13x murder, charges eventually dropped			4/21/16: released from jail
Robert Allen Weitzel	M	USA, TX, Utah, Layton		MD, psychiatrist. Psycho-geriatrics	morphine	2000-2002		5x murd, 2x mansl., 3 negl. Homi, prescription drug fraud	convicted		judge overturned murd, mansl, negl homi convictions based on procedural error. Sentenced 1yr for drug fraud. Recharged for felony mansl. And negl. Homi
Lucia de Berk	F	Holland, The Hague		RN, peds & adult floor, hospital	morphine/ digoxin		1997-2002	7 murders, 3 attempted murd.	7 murd, 3 attempted murd., life sentence, successfully appealed	yes	

SMHP Spreadsheet Cases acquitted but civil suit filed

Name	Sex	Country, City	Age at Discovery	Profession, Area of Work	Method	Year of Discovery	Duration suspected	Charges	Conviction	Acquitted/ dropped	Details
Nurse A.	F	Canada, Toronto		RN, neonatal ICU and peds	inj. Digoxin	1981		4x murder, 6x assault	charges dropped		18 susp infant deaths. Wrong nurse arrested. No charges brought ag. Nurse A, nurse associated w/deaths by the CDC study
Jane Bolding	F	USA, MD, Prince George's County		RN, ICU, KCl	potassium chloride	1985	1983-1984	3x murder, 2x attempt murd.		yes	17 susp murders, 23 susp attempted murd., acquitted. $8 million in damages paid for wrongful death claims
Michael Beckelic	M	USA, AL, Maxwell		Med Tech, Air Force Base	lidocaine	1988			charges dropped		21 susp murd, 11 attempt murd. $27 million in civil damages for injecting 9 infants
Aleata Beach	F	USA, OK		RN, practical nurse, hosp.	injecting air/ potassium chloride into veins	1994	1994	4 murders, confessed and attempted suicide	1995: case dropped for lack of evidence.	yes	confession ruled insufficient evi., families of deceased filed civil suit in 1995. outcome unknown
Thomas K	M	Germany, Berlin		RN, ICU, hosp		1996		5x manslaughter	unaccountable for actions		admitted to psychiatry
Michael Coons	M	USA, OR, Portland		RN, Nsg. Home	morphine	1998		4x murd, 1 attempted murd	not indicted		Deemed psychiatrically ill
Richard A. Williams	M	USA, MO, Columbia		RN, VA Hospital	succinylcholine	2002	1992	10x murder first degree	2003: charges dropped	yes	VA Hosp. liabile for $450,000 in wrongful death charges. 41 susp deaths. New science questioned toxicology results.
Howard Martin	M	Wales, Conway		GP	Overdosing Diamorphine	2004		2011: acquitted		yes	
Avola Humphreys	F	Wales, Bodawen		RN, nursing home		2005		1x manslaughter, 7x assault	acquitted	yes	

Pending/Outcome Unknown

Name	Sex	Country, City	Age at Discovery	Profession, Area of Work	Method	Year of Discovery	Duration suspected	Charges	Conviction	Acquitted/ dropped	Details
Billy Kipkorir Chemirmir	M	USA, Texas, Dallas	45	RN, home health care nurse	smothers victims then steals jewelry	2018	2010-2018	2018: charged 2x murder, 2x attempt murd., investigation ongoing			
Nurse F.	M	Belgium, Namur	42	RN, Meux elder care home	inj. insulin, 21 suspected deaths	2018		2018: charged 2x murder, currently court is investigating charges			
William George Davis	M	USA, Texas, Tyler	34	RN, Louis and Peaches Owen Heart Hospital	introduced air into circulatory systems	2018	2017	2018: charged 1x murder and 7x intentionally causing stroke-like injuries			may have caused a 2nd death
Rahiied A.	M	Netherlands	21	Aide, Home for elderly	inj. insulin	2017	2017	7x murder, 8x attempted murd.	2018: trial results pending		Concealed criminal background, theft of a patient, sentenced to community service
unknown		Japan, Yokohama		Oguchi Hospital	inj. poison into multiple IV bags, possibly bleach	2016	2016	killed 2, 48 suspicious deaths			no suspect, believed to be a healtchare pro
Hans M.	M	Germany, Koln	30	RN, Klinikum Holweide	inj KCL	2006		susp of involvment in 25 deaths	outcome unknown		
Doris B.	F	Germany, Straubing		RN, hospital	morphine	2005		manslaughter, susp of killing 7 patients	results of trial unknown		
Heather Clowe	F	Ireland, Dublin, Scotland		RN, care home	poison	2003		2x assault, 2x administering a harmful substance	results of trial unknown		

SMHP Spreadsheet Data Update since 2006-2018

Name	Sex	Country, City	Age at Discovery	Profession, Area of Work	Method	Year of Discovery	Duration suspected	Charges/ Conviction/ Suspicious Deaths	Acquitted/ dropped	Latest news	Details
Nurse F.	M	Belgium, Namur	42	RN, Meux elder care home	inj. insulin, 21 suspected deaths	2018		2018: charged 2x murder, currently court is investigating charges			
Billy Kipkorir Chemirmir	M	USA, Texas, Dallas	45	RN, home health care nurse	smothers victims then steals jewelry	2018	2010-2018	2018: charged 2x murder, 2x attempt murd., investigation ongoing		2018	
William George Davis	M	USA, Texas, Tyler	34	RN, Louis and Peaches Owen Heart Hospital	introduced air into circulatory systems	2018	2017	2018: charged 1x murder and 7x intentionally causing stroke-like injuries			may have caused a 2nd death
Rahiied A.	M	Netherlands	21*	Aide, Home for elderly	injected unauthorized insulin	2017	2017	Arrested for killing at least 3, said he wanted to make them sicker and assist them		2017	Concealed criminal background, theft of a patient, sentenced to community service
Garry Steven Davis	M	Australia, Newcastle	29	aged care worker, SummitCare Wallsend aged care facility	inj. Insulin	2016	2013	2016: charged and sentenced 40 yrs for 2x murder + 1 attempted m.			launched appeal in 2017
Elizabeth Wetllaufer	F	Canada, Ontario	49	RN, Caressant Care nursing home	inj. Insulin	2016	2007-2014	2017: life in prison for 8x murder, 4x attempted m, 2x aggravated assault			confessed, remourseful
Hayato Imai	M	Japan, Yokohama	23	care worker, Kawasaki nursing home	threw 3 victims off balconies	2016	2014	2016: charged with 3x murder, 2018: convicted, death penalty			confessed then recanted
unknown		Japan, Yokohama		Oguchi Hospital	inj. poison into multiple IV bags, possibly bleach	2016	2016	killed 2, 48 suspicious deaths		2016	no suspect, believed to be a healtchare pro
Vera Maresova	F	Czech Republic, Rumburk	50	RN, Hospital, elderly patients ICU,	Injects Potassium Chloride directly into veins	2015	2010-2014	Arrested for 1 70 yo f, confessed to five more	Yes	2017	Court said no evidence of crime, nurse compensated
Fausta Bonino	F	Italy, Piombino	55	RN, ICU	inj. Heparin to trigger hemorrhages	2015	2014-2015	2014: charged 14x supsicious deaths 2018: ??			charges eventually dropped
Megan Haines	F	Australia, Balina	49	RN, St.Andrews Village Nursing Home	inj. Insulin	2014	2014	2014: Charged 2x murders, 1 assault, 2016: convicted, 36 year sentence			
Ivo Poppe	M	Belgium, Bruges	61	RN, Roman Catholic deacon, clinic in Menin	inj. air into veins	2014	1980s-90s	2014: charged murder 10x, 2018: convicted murder 5x, 27 yrs in jail		2018	called "Deacon of Death" admitted to 10-20 killings
Regina K	F	Germany, München	33	Midwife, maternity clinic	Injecting heparin (blood thinner) prior to c-sections	2014		2016: convicted 7-9x attempted murder, 2x grievous bodily harm/ 15 year sentence			
Victorino Chua	M	Great Britain, Manchester	48	RN, Stepping Hill Hospital in Stockport	insulin poisoning, tampering of saline bags	2014	2011-2014	2015: charged and convicted 2x murder and 31 other charges re: poisoning of patients. 35 yrs before parole. 2017: appeal denied			wrote 13 pg letter "Angel turned evil"
Daniela Poggiali	F	Italy, Ravenna	42	RN, Lugo di Romagna hospital, Gen Med ward	Potassium chloride in drip	2014		2016: life in prison for 1 murder, suspected of 38. 2017: acquitted and released- spent 3 years in jail	yes		took a smiling photo with a dead patient
Virginia Soares de Souza	F	Brazil, Curbita	55	MD,Head of ICU, Evangelical Hospital	prescribing medications and changing ventilation standards to clear beds 300 † suspected	2013	2011-2013	2013: charged with murder 7x, 2017: cleared of charges	yes		

SMHP Spreadsheet Data Update since 2006-2018

Ariel Acevedo	F	Uraguay, Montivideo	46	Aide, Hospital Maciel, Neuro. Surg. IC. CCU	Air embolus, unknown IV drugs	2012		Charged 15x murder, 14 yr. prison. Acquitted, lack of evidence	yes		w/ Marcelo confessed but said were pressed by police
Marcelo Pereira	M	Uraguay, Montivideo	40	Aide, Hospital Maciel, Neuro. Surg. IC. CCU	Air embolus, unknown IV drugs	2012		charged 15x murder, 16 yr. prison. Acquitted, lack of evidence	yes		w/ Ariel confessed but said were pressed by police
Roger Kingsley Dean	M	Australia, Sydney	35	RN, Quackers Hill Nursing Home	arson	2011		2013 life, no parole, for 11x murder + 8 grievous bodily harm + theft			Caused a fire 7 hours atfer police interview abt theft of medication
Nicolas Bonnemaison	M	France, Bayonne	50	MD, Emergency room specialist	euthanasia, poisoning 7x	2011	2010-2011	2014: acquitted on 6 deaths	yes	2015	Enormous support colleague workers. 2 yr. suspended sentence + 30.000 euro compensation † one pat. Reaction: attempted suicide
Angelo Stazzi	M	Italy, Rome (Tivoli)	65	Alex Sant Angelo Romano-nursing home	inj. Insulin	2010		2010: 24 yr for murder on ex-female friend and colleague. 2014: murder 7 patients			
Joan Vila	M	Spain, Olot	45	Geriatric help, La Caritat	bleach, acid, combination of drugs	2010		2013: 127 yrs prison for 11 murders			Would have liked that someone had ended his suffering
Angela Almore	F	USA, Chappel Hill, NC	50	RN Alzheimer's Unit	Injected unauthorized opiates	2010	2010	Indicted for 1 murder, 6 assaults, pled guilty, sentenced to < 1 year		2012	14 patients tested positive for opiates that weren't ordered, one died, 6 more resp. problems, Said she wanted to keep them quiet.
Kermit Gosnell	M	USA, Pennsylvania, Philadelphia	69	MD, Women's Medical Society clinic in Philadelphia	used scissors to kill 7 babies in botched abortions, women died from surgery	2010	1980-2010	2011: charged 8x murder, 2013: convicted 3x murder, 1x involuntary manslaughter, sentenced to life without parole			performed illegal late term abortions, violated all health codes
Aino Nykopp-Koski	F	Finland, Helsinki	50	RN, Various hosp., nursing homes and home care	inj, sedatives, opiates and insulin	2009		Charged: 5 x murder, 6 attempt.murd. + aggrav. assaults +theft. Life for 5 x murder + 5 attempt.murd.			appeal denied in 2011
Bianca D	F	Germany, Dresden	32	RN, Dresden-Neustadt, hosp., geriatr.		2009		Charged: 2 x murder, 3 attempt.murd. Life for 1 x murd., (adoptive mother) 2 attempt.murd. (patients)			Suspect of more murd. in the priv. domain. Outcome appeal?
Kimberly Saenz	F	USA, Texas, Lufkin		LVN, DaVita dialysis Centre	inj. Bleach	2008		April 2012, life for 5 x murder, 5 x aggravated assault			History of turbulent employment. Killed 3 in one day
Michael Fontana	M	USA, Texas, San Antonio		RN, Air Force Captain, Wilford Hall Medical Center	Charged killing 3-5 patients	2008		2009: aquitted by military court	yes		
Kurt Dobbelaere	M	Belgium, Ghent	43	RN supervisor, elderly nursing home	inj. Insulin	2007		Charged: 4 x murder + 1 x attempt. murd. Life for same			
Petr Zelenka	M	Czech Republic, Havlickuv Brod	30	RN, elderly nursing home	inj. insulin	2007		Life for 7 x murd., 10 x attempt. murd.			Mandatory compens. of $160,000 USD

SMHP Spreadsheet Data Update since 2006-2018

Katariina (Catherine) Pantila (Loennqvist)	F	Finland, Ylöjärvi /Tampere	26	RN	1x causing † infant during family gathering + 1 x pat. In Ylinen Rehabilitation Facility., inj. insulin	2007		Charge 1 x murder,1 x attempt.murd., 2 x aggrav. assaults. Life for 1 x murder + 1 x attempt. murder			Found dead in prison cell in 2010
Rachel Baker	F	Great Britain, Butleigh, Somerset	44	RN supervisor, residential care	Injecting Tramadol	2007		Charged: 2 x murd. 12 susp. † 2010: found not guilty of murder	yes	2010	Stole painkillers to control her migraine attacks. Whistle-blower awarded
Irene Becker	F	Germany, Berlin	53	RN, Charité hosp., I.C	inj. Nitroprussid-natrium, Dormicum	2006		Charged: 6 x murd., 1 x attempt. murd. + grievous bodily harm. Life for 5 x murder,1 x attempt. murd. + griev.bod. harm			
Hans M.	M	Germany, Köln		RN, Klinikum Holweide.	inj. KCL, Susp. involvement In 25 †	2006		no data found on internet			
Chislain Dusart	M	Belgium, Boutersem	53	Occupational Therapist, Nursing home, Van Roosbeek, Vondelhof	inj. insulin	2005		Charged 1 x murder. convicted 21 yrs. for 1 x manslaughter			Behaved like (& called himself) a doctor
Abraão José Bueno	M	Brazil, Rio de Janeiro	27	Aide, (nurse tech)UFRJ/ IPPMG hospital, child.ward	inj. Fenobarbi- tal, midazolam, curare	2005		Charged: for 4 x murder and 4 x attempt. murd.110 yr. for 4 x murder + 4 x attempt.			appeal denied in 2011
Niels Högel	M	Germnay, Oldenburg +Delmenhorst	38	RN, ICU Gilurytmal (Ajmaline)	tempering equipment, creating resussitations	2005	1999-2005	2005: 5 yr, + 8 months prison for 1 x murder. 2015: life in prison for more. 2018: charged with 97 more			possibly 200 + murders
Margarete G.	F	Germany, München	58	Aide, home care	inj. opiates + suffoc.	2004		Life for 1 x murder 1			
Maxim Petrov	M	Russia, St. Petersburg	35	GP, home visits	inject. cocktail of drugs	2000		Charged: 17 x murder. Life for 12 x murd. + 19 susp. murd.			
Alfonso De Martino	M	Italy, Albano Laziale		Ospedale San Guiseppe + home care.	Citrosil (detergent) + pavulon	1993		1995: life for murder 3♂ + 1♀, possible more			Believed in occultism. Wearing devil images. Predicting deaths precisely. Nickname: Infermiere Satanista
Antonio Busnelli	M	Italy, Milan	50	nurse, Fatebenefratelli hospital, ICU	Isoptin, (vasodilator)	1992		1993: 28 yr prison for multiple attemp. murder + 2 murders			Financial compensation from funeral agency. Seemed to have also helped with preparation of remains

Commentary

Health Care Serial Murder: A Patient Safety Orphan

Kenneth W. Kizer, M.D., M.P.H.; Beatrice C. Yorker, J.D., R.N., M.S.

Two recent instances of alleged health care serial murder (HCSM) highlight the complex issues associated with these occurrences and raise questions about the priority of efforts to address this problem and the adequacy of current health care safety systems for preventing such intentionally caused adverse events.

In April 2009, a licensed vocational nurse (Kimberly Saenz) was indicted for capital murder and aggravated assault for reportedly injecting 10 renal dialysis clinic patients with bleach; 5 of the patients died.[1,2] Additional deaths are being investigated, and legal proceedings are ongoing in the matter. In the other case, in March 2009 an Air Force nurse (Michael Fontana) was charged with murder for reportedly injecting 3 elderly ICU patients with excessive amounts of narcotics and lorazepam.[3,4] He was additionally charged with altering the medical records of the patients. In November 2009 he was acquitted of all charges, and at the time of this writing is awaiting a clinical competency evaluation.[5]

Since 1975, at least 35 health care workers in the United States have been formally charged with serial murder of patients.[1–4,6] Additional persons have been investigated for such crimes but have not been prosecuted because of problems with the evidence needed for indictment and prosecution. Ironically, health care workers are overrepresented among known serial killers in general, and some of the worst serial killers of all time have been physicians.[7–9]

The Epidemiology of Health Care Serial Murder (HCSM)

HCSMs share common characteristics of setting, circumstance, and psychopathology that differentiate them from other homicides or serial murders,[7,10] including:

1. The murders, or attempted murders, are of patients in a health care setting.
2. The perpetrator of the crime is a health care worker at the medical facility where the incident occurs.
3. Two or more patients are affected in separate incidents that span a period of time that is usually longer than 30 days.
4. The malicious acts occur consequent to the health care worker's duties.
5. The perpetrator has the psychological capacity for committing additional malicious acts affecting patients, as usually determined during the investigation of a suspicious incident.

HCSM should not be confused with euthanasia, assisted suicide, the mass murder or assault of patients for political reasons, or the episodic murder of a patient as a crime of passion or in the course of carrying out another crime.

Multiple instances of HCSM have been reported on,[11–21] but few reports have tried to collate data about these occurrences.[6,22,23] Studying HCSM is especially difficult because the events are rare, there is no disease classification code or other specific method to identify such deaths, the events are not generally required to be reported to public health agencies, and there is no centralized source of information about such occurrences. Law enforcement statistics are not helpful because they do not routinely distinguish murder victims at health care facilities according to whether they are patients, staff or visitors.

A review of 90 health care professionals prosecuted for HCSM between 1970 and 2006 identified more than 100 instances of suspicious deaths.[6] Reported instances were from 21 countries and 22 states in the U.S., with the latter accounting for 40% of the incidents and Texas having the most of any American state. Multiple additional instances have been reported in the media from several countries since this study was published. The recently reported instances in the U.S. occurred in Texas. Whether HCSM is truly more common in the U.S. than in other developed countries, or in Texas compared with other states, cannot be determined from current data.

More than 1,050 suspicious deaths have been linked to persons charged with HCSM in the U.S. since 1975, for an average of 30 such deaths per year. However, the circumstances of many of the convicted health care serial murderers suggest that additional killers have not been recognized,[6,7] so the actual number of patients harmed by these acts may be higher.

The number of health care workers charged with HCSM has increased in each of the past four decades, with more than four times as many being reported worldwide during 2000–2009 than 1970–1979.[6] The trend in the U.S. suggests an increase, but the trend is less clear than for the number worldwide.

Most reported instances of apparent HCSM have occurred in countries having technologically advanced health care and generally in health care settings employing sophisticated technology.[6] These events most often have occurred in acute care hospitals (70%), followed by nursing homes (20%) and outpatient settings (10%), with the perpetrator often murdering in more than one health care setting and/or in multiple geographic locations.[6,10,19] The types of health care workers involved have included nurses (68%), nursing aides (18%), physicians (12%), and allied health professionals (2%).[6] Physicians have been involved with a relatively small percentage of the incidents but have accounted for a disproportionately large number of deaths.[6,8,9]

The most common method of HCSM has been intravenous injection of a noncontrolled medication such as epinephrine, succinylcholine, concentrated potassium chloride, digoxin, or insulin.[6] Narcotics are rarely used by health care serial killers in the U.S. (in contrast to assisted suicide or euthanasia), and then mostly by physicians. Other methods have included suffocation (for example, smothering with a pillow), drowning (for example, by pouring large quantities of water into a patient's mouth), intravenous injection of air (air embolus), and tampering with medical equipment.

The Difficulty of Investigating and Prosecuting HCSM

When considering the mortality attributable to health care serial killers and the number of persons prosecuted for these crimes, it should be recognized that modern health care provides many nearly ideal settings and circumstances for committing murder without being detected or held accountable.[24] Patients are often disoriented, sedated, or not aware of their surroundings or what is being done to them. They may be severely weakened and unable to defend themselves. Caregivers often work alone and in private and have ready access to multiple potentially lethal agents, the use of which may not be attributable. Care may involve numerous types of technology used by, or invasive interventions performed by, persons unknown to the patient or other caregivers. In addition, death is a relatively frequent occurrence in health care facilities, so a patient's death initially may not be suspected of being due to a criminal act even when it is unexpected.

Law enforcement officials have repeatedly noted that the investigation and prosecution of suspicious health care deaths is exceptionally complicated and is often confounded by routine health care practices that result in potential evidence of wrongdoing being destroyed or not safeguarded in a manner that it can be used for forensic purposes. For example, bodies are customarily moved from the site of death and the site is cleaned soon after the patient's demise, thereby precluding crime scene investigation. Resuscitation efforts may destroy the crime scene. Bodies may be cremated before foul play is suspected, or bodies may be embalmed and buried, complicating use of toxicological evidence because of problems interpreting data from exhumed bodies. Drugs used to commit the murder may have been used therapeutically, also complicating toxicological findings. Physician orders and hospital protocols may be vague or ambiguous in specific patient care situations. Medical records may be incomplete, unclear, or even contradictory. Further, information about the death may not be readily shared because of patient privacy reasons, causing delays in recognizing foul play.

Evidence problems have been a repeated issue in obtaining indictments or when prosecuting suspected health care serial killers because "proof beyond a reasonable doubt" is necessary in criminal cases. Evidence problems have often forced plea bargains for crimes less serious than murder or have precluded prosecution altogether despite compelling epidemiologic evidence. Even in successfully prosecuted cases, problems with evidence have resulted in most health care serial murderers being prosecuted for only a small fraction of the actual number of patients murdered. For example, the British general practitioner Harold Shipman was convicted of murdering 15 patients but was positively linked to 218 additional unexpected deaths and was suspected of murdering yet another 62 patients.[18,20] Charles Cullen was convicted of 11 murders but confessed to killing more than 40 patients.[21] Kristen Gilbert was suspected of killing as many as 50 patients but was convicted of only 4 murders and 2 attempted murders.[21] Kimberly Saenz has been charged with murdering 5 patients and with assaulting 5 others in attempts to kill them, but 19 deaths were reported at the dialysis clinic where she worked in the five months before she was fired, far more than the state's average death rate at dialysis clinics.[1]

Is HCSM a Significant Health Care Problem?

On the basis of the relatively small number of deaths known to be caused by HCSM, one might reasonably conclude that it is not a significant health care problem compared with many others—which probably explains why so little has been done to

address the problem. However, these efforts contrast sharply with what has been done to understand and prevent other similarly rare safety-related causes of death. For example, about 15 deaths from dog bites occur each year in the U.S.[15,16] In contrast to HCSM, however, information about fatal dog bites can be readily obtained from multiple databases, such incidents have been widely discussed in public forums and have resulted in hundreds of local ordinances and state laws, and numerous studies have been conducted to understand their causes and prevent further occurrences. Even much rarer animal-related trauma such as shark attacks and deaths caused by cows are regularly tracked in various databases and have received much greater attention by public health agencies and health care professionals than HCSM. Similar contrasts could be made for many other rare safety-related causes of death, including scuba diving or mountaineering accidents and subway accidents, to name a few.

In comparing the burden of harm caused by HCSM with that of dog bites or other similarly rare causes of death, one might argue that these other safety problems have received more attention because the events generally do not result in death but instead cause less serious morbidity in a substantial number of people. Although this may be true, it must be remembered that HCSM by definition includes only deaths and that it is only one of several types of intentionally caused health care harm. To truly compare the burden of harm caused by these different types of conditions would require including sexual assault, verbal and physical abuse, theft of a patient's personal property, medical identity theft, intentional unauthorized disclosure of protected health information, kidnapping of infants or elderly persons, intentional withholding of necessary care or performance of unnecessary medical interventions for financial or other nonmedical reasons, and the illegal harvesting of body parts, among other things, along with HCSM deaths. These other forms of intentional harm also occur infrequently, although some of them are known to be increasing and to affect substantial numbers of people.[27–30] None of these intentionally harmful health care problems have been well studied, and neither health care nor law enforcement have established infrastructures to track and analyze these adverse events to understand their causes. This is analogous to the "orphan" status that a number of conditions have for drug treatment or vaccine development. In contrast to HCSM and other types of intentional health care harm, however, "orphan drugs" have been the subject of much study and policy debate.

Episodes of HCSM have often spanned prolonged periods of time (sometimes decades), involved large numbers of victims before being recognized, were perpetrated by the same individual in multiple settings and/or geographic locations, and were suspected by co-workers long before any formal investigation was undertaken. These characteristics highlight significant vulnerabilities in health care safety systems, including problems in sharing information about potentially problematic health care workers, delayed recognition and inadequate investigation of suspicious incidents, inconsistent or ineffective methods of monitoring and evaluating important care-related adverse events, and an incomplete understanding of the causes of these occurrences. HCSM is similar to other patient safety problems in some of these ways. The root causes of these vulnerabilities have not been specifically studied but appear to include a number of interrelated reasons, including the rarity of such events, the view that such occurrences are a law enforcement problem, a reluctance to investigate suspicious incidents for fear of drawing attention to them, professional defensiveness and protectionism, and the belief that such occurrences are not a sufficiently important health care problem to warrant attention in the context of many other pressing health care concerns and threats to patient safety.

Although HCSM, per se, is not specifically mentioned, murder and other assaults on patients, whether by health care workers or others, are identified by the National Quality Forum (NQF) as a "serious reportable event" or, as they are more commonly known, a "never event."[31,32] These rare adverse events, which should never occur in health care, were culled from the many unusual or rare untoward clinical events known to happen because they are serious, adverse, and largely preventable; because they indicate systemic problems in health care safety that are significantly influenced by policies and procedures; and because they are important for public credibility and public accountability, among other reasons.[31] Although a few states require that some or all of the NQF's 28 never events be reported, most do not.

HCSM Raises Challenging Questions

Although infrequent, malicious acts affecting patients certainly occur, and the occurrence of at least some types of these intentionally harmful acts appears to be increasing (for example, HCSM). This raises challenging questions about the appropriate priority of addressing these adverse events and prudent strategies for doing so, as well as health care's obligation for public accountability about such matters.

After a patient death is suspected of being due to a criminal act, law enforcement personnel clearly must become involved, but what is health care's responsibility for preventing such occurrences? Murdering a patient egregiously violates the core

values and ethical tenants of all the health care professions. Even though such events occur rarely, should not the egregious nature of such acts be sufficient reason for HCSM to be a priority notwithstanding the multitude of other health care problems needing attention and resources? Because society places extraordinary trust in health care workers and expects health care facilities to be safe havens for the ill and injured, does not health care as an enterprise have an obligation to make extraordinary efforts to ensure that health care workers do not breach the public's trust? Given the intrinsic nature of modern health care and the frailties of human beings, does more need to be done to ensure that health care workers do not have psychological conditions that might make them potentially dangerous? Must an increased risk of HCSM be accepted as a side effect of the many technologies now used to treat disease, or does modern health care have an obligation to make every reasonable effort to prevent the intentional misuse of these technologies? Reducing harm resulting from medical errors and other unintentional causes of health care harm has proven to be quite difficult. Would strategies to address HCSM conflict with those needed to prevent more frequent unintentionally caused adverse events and thereby confound efforts to prevent these threats to patient safety?

Possible Strategies to Understand and Prevent HCSM

We believe that greater efforts should be made to build a capacity to understand the causes of HCSM and to strengthen the weaknesses in health care safety systems revealed by these occurrences. On the basis of our experience dealing with other patient safety and public safety problems, as well as direct experience managing incidents of HCSM, we believe that several actions would be reasonable first steps toward this end.

First, we believe that health care organizations, accrediting bodies, and licensing agencies should do more to increase awareness of HCSM among health care professionals. Granted, it is disturbing to think that physicians, nurses, or other health care workers might intentionally kill or seriously harm patients entrusted to their care, and there is a fine line between acknowledging the problem and inappropriately frightening patients and undermining public confidence in hospitals and other health care facilities, but the first step in addressing any problem is acknowledging that it exists. Management of other safety problems suggests that transparency is critically important despite the challenges that such openness may initially present.[33] Conceptually, this is not unlike what has been done to increase awareness about other patient safety problems, although communications about HCSM would need to be crafted especially carefully.

Second, because no professional health care organization, public health agency, or law enforcement entity currently maintains data about or otherwise has specific responsibility for addressing HCSM, an appropriate U.S. federal agency should be designated and empowered to collect and analyze data about these occurrences and to maintain a clearinghouse of information on the subject. The ownership of this problem could be given to a number of existing entities whose mission includes analyzing and being an authoritative resource about unusual occurrences, such as the Agency for Health Care Research and Quality, the Centers for Disease Control and Prevention, or the Federal Bureau of Investigation.

Third, the effectiveness of current methods for determining the training, experience, qualifications, and performance of health care workers and for communicating complete and timely information about these things should be assessed. This should include an evaluation of peer review, licensure, adverse event reporting, and the National Practitioner Data Bank (http://www.npdb-hipdb.hrsa.gov/). This assessment would need to be conducted by an independent entity experienced in evaluating complex and sensitive issues—for example, the Institute of Medicine of the National Academy of Sciences or the National Academy of Public Administration.

Little comparative information about employment screening practices across the health care professions is available. An assessment of the U.S. Department of Veterans Affairs facilities judged these practices to be adequate for physicians but deficient for other types of practitioners.[34] Data communicated about a former employee to a prospective employer usually includes just the dates of employment. Meaningful information about a worker's performance is not routinely shared. Lack of communication about a health care worker's past performance has been repeatedly identified as a problem in cases of convicted health care serial killers. In response to criticism in this regard, hospitals have often cited fear about being sued for defamation if they report concerns about a former employee's past performance to prospective new employers. Whether such fears are well founded should be assessed, as well as the options for mitigating them if so. In the aftermath of the Charles Cullen murders, Pennsylvania and New Jersey enacted laws to protect hospitals from lawsuits for providing honest job evaluations and work histories to prospective new employers, but such laws are rare. Good Samaritan–type federal legislation to protect individuals and institutions from liability for good-faith reporting of truthful information about a health care worker's

performance might be an effective way to remedy this systemic vulnerability. This strategy should be evaluated. Federal legislation would be needed to provide consistent protection across states.

Peer review and professional licensure are the primary processes used to ensure the competence and integrity of health care workers; however, investigations into reported occurrences of HCSM have repeatedly raised questions about why these processes did not cull out the problematic worker. The reasons for this need to be fully evaluated. Concerns about the adequacy of these processes also have been raised by recent reviews that were performed for reasons unrelated to HCSM,[28,35–37] as well as by some recent legal cases.[38,39]

The effectiveness of fingerprinting and criminal background investigations as strategies for protecting patients from malicious harm by health care workers also needs to be assessed. For reasons unrelated to HCSM, a number of states have recently imposed requirements for health care workers to be fingerprinted and undergo criminal background investigations in the belief that such interventions will identify persons more likely to commit malicious acts, although there is little empirical or other data to support such strategies. Of interest in this regard, it appears that a history of a health care worker falsifying his or her background appears to correlate more closely with later murdering patients than does a past history of a criminal act.[6,10]

Fourth, because specific methods are needed to properly manage adverse events suspected of being intentionally caused, and because most clinicians and health care administrators are unlikely to be familiar with these methods, consensus guidelines for managing suspicious situations would likely be helpful. In many of the cases of convicted health care serial killers, concerns about the worker arose long before any action was taken. When action was finally taken, the worker was often simply terminated, after which he or she went on to commit additional patient murders at another health care facility.[6,10,19] The guidelines should therefore detail, at a minimum: (1) what circumstances should prompt consideration of an event being intentionally harmful, (2) when suspicious circumstances should be reported to public health and law enforcement authorities, and (3) procedures for collecting and safeguarding potential evidence and documentation that may be later needed for forensic purposes. These guidelines could be developed by the NQF as part of its ongoing work in identifying evidence-based safe practices,[40] the Institute of Medicine, or similar health care–related entities working in collaboration with public health and law enforcement organizations.

Fifth, current strategies for addressing unintentional patient safety problems should be reviewed for ways that they might be augmented or enhanced to better protect patients from HCSM. Policies and procedures for use of high-alert medications should be particularly reviewed because administration of non-narcotic medications has been the primary weapon used by health care serial killers in the U.S. It also would be helpful to know whether the use of automated drug dispensing technologies that have become widely used in hospitals in recent years has changed this pattern. Similarly, processes used for monitoring and evaluating sentinel events in health care facilities should be specifically assessed because in most known instances of HCSM suspicion of a malicious act arose because co-workers of the perpetrator observed an increased frequency of deaths or cardiac arrests associated with a particular care unit, work shift, and/or caregiver. Whether unusual situations needing detailed investigation could be better identified by routinely monitoring monthly mortality and cardiac arrest rates by time of day, unit of care, primary diagnosis, and cause of death—or whether it would be practical to do so—should be assessed. This review could be conducted by the Institute of Medicine, NQF, Agency for Healthcare Research and Quality, or other entities.

Conclusion

The importance of integrated safety systems in health care is now well recognized, and widespread efforts to strengthen health care safety systems have been made in the last decade. These efforts to improve patient safety have not included strategies aimed at preventing HCSM. Although instances of HCSM are rare, they appear to be occurring more frequently. These occurrences have repeatedly highlighted significant vulnerabilities in health care safety systems and have raised challenging questions about the public accountability of health care as an enterprise. We believe that more should be done to build a capacity to understand the causes of and to prevent HCSM, and we recommend that several actions be taken toward this end. ■

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AONE GUIDING PRINCIPLES

TO PROTECT PATIENTS FROM RECKLESS BEHAVIOR BY REGISTERED NURSES

Background

The nurses and caregivers in our health care system are on the frontlines of care, serving a special role that mandates a high standard of care to ensure a safe patient culture. This standard was paramount when the leadership of the American Organization of Nurse Executives (AONE), American Society for Healthcare Risk Management (ASHRM), and the American Society for Healthcare Human Resources Administration (ASHHRA) met to discuss how this process could be improved. Although rare, headlines remind us that criminal behavior does occur that requires us to be ever vigilant in our protection of patients. It was critical that these three organizations collaborate to develop guiding principles for further discussion and use by respective members – nurse leaders, health care risk managers, and human resource professionals.

The resulting guiding principles include suggested practices as a starting point for organizations interested in reviewing their preparedness to deal with a provider who may act in an at-risk or reckless manner. The exhibits attached are intended as examples to assist organizations in building on their own knowledge and practices.

It is our intent that each health care organization will consider these approaches as a starting point and use their own substantive knowledge, expertise, and best practices to build the details of processes appropriate for their organization.

Purpose Statement

This document establishes guiding principles for the identification and mitigation of registered nurses/advanced practice registered nurses (APRNs) that may act in manner detrimental to a patient's safety when conducting their professional duties.

These principles are based on the tenets of *Just Culture* espoused by James Reason, which is the development of a trusting environment in which people are encouraged (even rewarded) for providing safety-related information; commitment to excellence; and establishment of guidelines that foster personal accountability as well as corporate self-regulation in matters of safety (Reason, 1997). We also recognize the body of work by David Marx and his analysis of behavioral concepts important to understanding the inter-relationship of discipline and patient safety (Marx, 2001). The *Just Culture* model describes three types of behavioral categories that we can expect in the occurrence of an adverse event. *Human error* is an inadvertent action—slip, lapse, or mistake (Marx, 2001). *At-risk behavior* is a behavioral choice that increases risk where risk is not recognized or is mistakenly believed to be justified (Marx, 2001). *Reckless behavior* is a behavioral choice to consciously disregard a substantial and unjustifiable risk (Marx, 2001). We will focus on *at-risk behaviors* and *reckless behaviors*.

As leaders of our professional organizations and on behalf of the patients we serve, we commit the experience and resources of our individual organizations to create awareness and discussion to ensure the safety of patients in our care. We believe that the following principles can guide us in this process.

Part I: Effective Recruitment, Screening and Hiring

It is essential that the recruitment, screening and hiring process for clinical staff/nurses is effective in order to protect patients and create a safe clinical environment for staff. The organization's health care human resource professional is an important resource as you consider clinical candidates.

The following are **Elements of the Recommended Hiring Process**:

- Human Resources reviews and approves candidate application form prior to position posting.
  - See Appendix for sample applicant reference form.
- Human Resources screens applications and conducts the initial candidate interview.
- The Nurse Director and/or appropriate staff conduct the next or second candidate interview.
- Human Resources conducts the candidate background check, which includes the following:
  - Drug screen to test for illegal substances and prescription drugs (barbiturates, opiates, amphetamines, marijuana/hashish; hallucinogens).
  - Criminal background check.
  - Verifies that candidate is NOT on the Medicare Exclusion list (footnote).

- If required by the state, obtains a copy of candidate fingerprints. If not required by the state, consider obtaining as part of the hiring process.
- Request a copy of candidate's last performance evaluation.

- Human Resources performs the following as part of the hiring process:
  - Verifies candidate's education and training.
  - Verifies candidate's Licensure with the relevant State Board of Nursing.
  - Queries the National Practitioner Data Bank (NPDB) for advanced practice registered nurses.
  - Human Resources conducts two to three candidate reference checks with former employers. Questions may include but are not limited to: recommend adding disclaimer – "Under advice of legal counsel."
    - Would you rehire candidate X? Yes No
    - If not, why? (Factors to consider include attention to safety, interpersonal relations, compliance, attendance, professional practice issues.)
  - Human Resources, after consultation with nursing hiring staff, decides to hire or not hire the candidate.
  - Human Resources communicates the hiring decision and terms to the candidate.

Part II: Ensuring Effective Clinical Onboarding

All newly hired clinical staff/nurses should have a defined probationary period during which goals are set to establish and assess competency. The length may vary, though 90 days is customary. A defined competency based orientation program, supervised by a registered nurse, is recommended.

Clinical staff is one of the most important assets of any health care organization. In order to attract clinical staff, it is important to effectively orient newly hired clinical/nurse staff.

The following are elements of an effective onboarding process:

- Use an onboarding process that is proactive, transparent and flexible.
- Engage those involved in the process, such as, but not limited to:
  - Human Resource professionals
  - Nurse managers
  - Senior executives
  - Health care risk managers
  - Others with a vested interest in the successful hiring and integration of clinical staff.
- Support and consistently communicate the processes essential to creating a safe patient and work environment, even if they are time-intensive.
- Engage those involved in efforts to continuously improve the onboarding process.

Part III: Monitoring Behavior

Monitoring for high-risk (i.e., at-risk or reckless behavior) requires a collaborative approach including Human Resources, Nursing Leadership, and Risk Management professionals. Hospitals/health care organizations should establish a defined mechanism to monitor, investigate and report at-risk or reckless behaviors.

The following are components of a process to **monitor high-risk behaviors of clinical staff**:

- Establish appropriate job expectations and performance criteria.
- Establish mechanisms for proactive performance review that includes behavioral performance.
- Establish a process to monitor and evaluate clinical staff transfers to ensure that registered nurses with high-risk behavior don't move within the facility as a way to avoid detection.
- Ensure that there are multiple mechanisms for employees and others to report suspicious or high-risk behavior.
- Establish mechanisms that provide ongoing assessment and monitoring of permanent and temporary staff for quality and safety of care (i.e., incident reports, sentinel events, complaints, grievances, near miss data, claims data, quality audits, and chart audits).
- Identify triggers that will alert staff of the need for further investigation of events that cause harm (i.e., discrepancies in medication administration, adverse drug events, and adverse events).

Part IV: Assess Culpability

Upon suspicion or detection of an adverse event that could be the result of malicious intent the following actions are recommended:

- Respond to the patient. Determine if there is an ongoing threat. Implement strategies to stop the loss or mitigate the loss, as appropriate.
- Notify the Risk Management Department and/or appropriate personnel pursuant to organizational policies and procedures.
- Remove registered nurse/APRN from unit/department.

- Contain the environment and evidence, if applicable.
- Ensure that staff is provided with support (i.e., employee assistance program, as indicated).
- Conduct a thorough investigation that is objective, purposeful, valid, confidential and timely. Investigation findings must permit analysis and corrective action to prevent reoccurrence. Disseminate those findings, as appropriate. Disclose to patient/family, as appropriate.
- Refer to "Workplace Violence" and "Fitness for Duty" policies.
- Implement Corrective Action/Disciplinary Action – consult with HR.
- Report as consistent with the requirements of the State Board of Nursing, accreditation or regulatory agencies, and/or law enforcement pursuant to applicable state laws and regulations.

The *Just Culture* model promotes creating an open, fair, and just culture that creates a safe haven for reporting and supports safe behavioral choices among staff. Under the *Just Culture* model, managing behavioral choices requires holding staff accountable for their behaviors. *At-risk behaviors* may be managed through coaching – removing incentives for at-risk behaviors, creating incentives for healthy behaviors, and increasing situational awareness. *Reckless behaviors* may be managed through remedial action and punitive action (Marx, 2001).

Conclusion

These principles and strategies are intended to assist organizations in addressing situations involving clinical staff, specifically registered nurses/APRNs, but they can be applied to any health care environment or other types of healthcare providers. The values that ground this work are: collaboration, partnership, and transparency. Incorporating these guiding principles requires trust, courage, and a deep commitment to change our current system and the development of processes and practices that will ensure patient safety and quality.

These principles require courage on the part of employees and employers to act in spite of personal fear or retaliation, organizational liability or legal implications, and regulatory/legislative barriers. We believe that the principles identified are essential for the creation of a community of trust among employers, employees and patients/families.

Appendix/Exhibits

- Resources and References
- Applicant Reference Form - This is intended to assist you in starting this recommended process. Consult with your legal counsel to ensure that other information should or should not be included on this form.

Resources and References

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Applicant Reference Form

Key aspects of the Applicant Reference Form include:

1. Employee's certification and waiver for information to be provided by former employers from employment within the past 3 years.
2. Demographic information.
3. Reason for separation from service.

The information above allows former employers to provide information regarding rehire, formal disciplinary actions due to incidents involving violent behavior, abuse, neglect, or negligence toward patients/clients/residents as well as other formal disciplinary action of a general nature. The former employer is asked to respond to questions regarding employee's attendance.

The form (on page 70) will provide your organization with a statement that indicates whether performance was satisfactory or less than satisfactory and give a brief description of documented unacceptable performance. Consult with your legal counsel prior to utilizing this or any other form to accept/document reference information on candidates.

This form will provide your organization with a statement that indicates whether performance was satisfactory or less than satisfactory and give a brief description of documented unacceptable performance. Consult with your legal counsel prior to utilizing this or any other form to accept/document reference information on candidates.

Applicant Reference Form

Instructions: Read each question carefully. Our organization is interested in gathering information about your employment within the past three years. If you were employed at only one institution within the prior three years, simply complete the information below. However, if you have worked for two or more employers during the past three years, you must complete a separate form for every employer during the past three year period.

Certification and Waiver

I certify that **all** information I will provide is true, complete, and correct. Any information provided found to be false, incomplete or misrepresented in any respect, will be sufficient cause to cancel further consideration of this application, or immediately terminate me from the employer's service, whenever it is discovered.

I authorize and request that my former employer listed on this form complete the form where indicated and release any **additional** information about my job performance that they may have upon receiving a further inquiry. My signature indicates my approval for this process and for the release of any such information requested during the reference. I waive all claims, any right of action, cause of action, or other means of redress related to both the completion of this form by my former employer and any further disclosure of information about me. I agree to release all prior employers from whom such information is obtained from any and all liability for damages of whatever kind or nature which may at any time result to me on account of compliance, or any attempts to comply, with this authorization.

I understand that the prospective employer does not unlawfully discriminate in employment and that no question will be used for the purpose of limiting or excusing any applicant from consideration for employment on a basis prohibited by applicable local, state, or federal law. **Finally, to the extent I have signed with my prior employer any document by which the prior employer promised not to disclose information requested on this form, I waive all rights to enforce such a promise and release my prior employer from any such non-disclosure obligation.**

I certify that I have read, fully understand, and accept all terms of this statement.

APPLICANT: _____ DATE: _____

Note: You must sign the consent and waiver for this form to be considered a valid document.

To Be Completed by Applicant

Name of Applicant: _____ Last 4 digits of the SSN: _ _ _ _

Former/Current Employer: _____

Employer's Address: _____

City: _____ State: _____ Zip: _____ Employer's Phone: (_ _ _) _ _ _ - _ _ _ _

Type of Facility: ☐ Hospital ☐ Long Term Care ☐ Agency ☐ Hospice ☐ Home Health
☐ Physician Practice ☐ Freestanding Ambulatory Center ☐ Other:_____

Position(s) held at this place of employment: _____

_____

I provided care to clients/patients/residents: ☐ Yes ☐ No Dates of employment: _____ to _____

Reason for separation from service (please check one):

☐ Resigned in good standing ☐ Resigned in lieu of termination* ☐ Terminated*

☐ Laid Off ☐ Other (specify): _____

*If terminated from employment or you resigned in lieu of termination, specify reason:

_____

Canadian Nursing Supervisors' Perceptions of Monitoring Discipline Orders: Opportunities for Regulator-Employer Collaboration

Farah Ismail, MScN, LLB, RN, FRE, and Sean P. Clarke, PhD, RN, FAAN

Employers are uniquely situated to assist regulators by monitoring nurses practicing with conditions and restrictions resulting from a discipline order by a regulator. However, attitudes, perceptions, and contextual factors may impact employers' participation, and their education and training needs must be considered. A quality-improvement study was conducted to target these areas and provide direction to regulators in developing education and outreach efforts for employers.

Employers are essential partners in monitoring the practice of disciplined nurses, especially those who have been ordered to undergo education, those whose practices have been restricted, and those who are expected to have their practices overseen. However, working with the regulatory process in general and with discipline orders in particular is not always easy for employers because of a lack of familiarity with the disciplinary process, constraints on their resources, and complex and conflicting responsibilities to their employees, their institutions, and their professional regulatory bodies (Budden, 2011; Tanga, 2011).

To meet their obligations to the public in the face of rising standards, more cases, and increasing costs, regulators must collaborate closely with employers. Even though the proportion of disciplined nurses is small, the workload has increased as nurse workforces have grown. Nationally representative U.S. data from 1996 to 2006 suggest that the proportion of licensed nurses who were disciplined rose from 0.1% to just under 0.2%, but the number of disciplined nurses rose from 3,000 to 8,000 across the 44 state boards (National Council of State Boards of Nursing [NCSBN], 2009).

In Canada, as in many other countries, regulatory bodies have the power in appropriate circumstances to require nurses found to have breached standards of practice to complete remedial education and can also place conditions on their return to nursing practice, including monitoring of the care these nurses provide. Generally speaking, employers are asked to assist in implementing and monitoring compliance with discipline orders in cases in which nurses are found to lack judgment and skill in specific domains or to have intentionally broken practice rules with generally good intentions—for instance, in connection with medication administration (Ismail & Clarke, 2014). The College of Nurses of Ontario, the regulatory body responsible for the largest number of nurses in Canada (akin to a state board in the United States), determined that a redesign of educational programs, materials, procedures, and policies for improving regulator-employer collaboration was a priority. However, a review of the literature revealed no research documenting employers' perspectives on collaborating with regulators. Therefore, a needs assessment of employers in Ontario was conducted to provide information about employers' involvement in the process and to direct next steps in enhancing regulator-employer partnerships.

The literature review highlighted key issues that were incorporated into the needs-assessment questionnaire. One issue was the notion that remediation is at the core of discipline orders. *Remediation* has been defined as the process of evaluation, counseling, and education to improve nursing practice at work (Harding & Connolly, 2012, p. 50). It includes learning and reflection about nursing conduct standards, close supervision, mentoring, and specific remediation of knowledge and skill deficits (NCSBN, 2012). The workplace is the logical venue for remediation and employers are well placed to observe practice. However, clarifications are required to prevent role confusion and allow all parties to identify the discipline order as the source of authority for oversight of and modifications to a nurse's practice (Harding & Connolly, 2012, p. 51).

Because the employers' primary goals are to hire enough nurses to provide competent, effective care and ensure that safe care is delivered, employers may be concerned about how discipline monitoring disrupts workflow. In particular, employers may not feel they have the time, money, resources, skills, and experience to effectively monitor nurses (Tanga, 2011), and smaller institutions may not have the staff to participate in the process

(Budden, 2011). The attitudes and perceptions, contextual factors, and education and training needs of employers were believed to be important considerations for employer engagement in discipline monitoring.

This article describes the needs assessment undertaken by the regulator in Ontario, Canada, and provides a review of the methods used and a summary of the findings and resulting implications.

Methods

The regulatory body, the College of Nurses of Ontario, provided internal approval for this anonymous short survey as a quality-improvement initiative. To meet funder and possible publication requirements, the study was further reviewed by the Western Institutional Review Board and approved as acceptable without full research ethics review.

A cross-sectional survey of nurses in leadership roles in Ontario was conducted in 2014. Potential respondents were identified from the regulator's database of nurses who renewed their membership for 2014, were employed in Ontario, and consented to be contacted via e-mail regarding opportunities to participate in nursing-related research. The goal was to obtain a representative sample of 600 to 1,000 nurses responsible for oversight and evaluation of nursing practice in a variety of settings. Approximately half of the 6,500 nurses listed in the database as having administration as their area of responsibility or having a position title of middle or senior manager were contacted. Participation was voluntary.

Those who agreed to participate were directed to a short online survey administered using a secure Web-based platform widely used in higher education, research, and market research and operated by Qualtrics (www.qualtrics.com). Respondents had 3 weeks to complete the survey. Contact information for the researcher was provided so participants could ask questions. To improve response rates, the researcher sent a reminder e-mail to nonrespondents at the end of week one and the end of week two (Dillman, Smyth, & Christian, 2009).

A set of survey questions was developed based on a review and analysis of the literature. Specifically, questions addressed the basis for discipline monitoring, the legal framework, and the constraints faced by employers as well as strategies for increasing employers' engagement (Ismail & Clarke, 2014). Demographic information was collected as well as data about participants' roles and work settings. The survey included questions about attitudes and perceptions about discipline monitoring, contextual factors that may impact involvement, and training needs. Throughout the survey, respondents were presented with free-text entry boxes so they could elaborate on their responses. Because it was anticipated that many participants would not have exposure to discipline monitoring, a hypothetical scenario in which an employer was monitoring a nurse who was disciplined for a series of medication errors was developed. Respondents were asked general questions about discipline orders and about their opinions regarding the hypothetical case. Consultants who had first-hand knowledge of discipline monitoring confirmed that the survey instructions were comprehensible and that the survey could be completed in 15 minutes. The consultants' feedback was incorporated into the final version of the survey.

Descriptive analyses (frequency counts and percentages) of relevant fixed-response questionnaire items were employed followed by a preliminary content analysis to identify themes in free-text responses (LoBiondo-Wood & Haber, 2010). Chi-square analyses were conducted to examine whether responses to the fixed-choice questionnaire items varied systematically by previous experience working with nurses with a discipline order and by work setting.

Results

Of the 2,928 nurses who received e-mail invitations, 1,648 completed the survey (a response rate of 56%). The 1,301 respondents who reported being currently involved in hiring, managing, or supervising nurses were the targets of the survey whose responses were analyzed further. Among these respondents, approximately 85% held middle and senior manager job titles, and 64% indicated that 10 or more nurses reported to them. Approximately 36% worked in hospitals, 26% in long-term care facilities, and 38% worked in community and other settings. Of the 1,301 respondents, 94% were female; 73% were between ages 40 and 59; and 60% held university credentials as their highest level of education. Only 32% reported that they had ever supervised or managed a nurse with a discipline order.

Need for Remediation

As indicated in Table 1, nearly all employers agreed with the fundamental ideas behind employer involvement in monitoring the practice of disciplined nurses. Among respondents, 90% or more believed that remediation was necessary to help nurses return to practice safely and that their participation in the process was important. In the free-text responses, one respondent wrote that "to ensure [a nurse] is practicing safely, monitoring...would be an essential component." Another stated that "a good mentoring program and direct observation of her medication administration is imperative." A strong majority of respondents also felt they could be effective when participating in discipline monitoring and were confident they could carry out their role in relation to a discipline order.

Employer Obligations and Concerns

As Table 2 shows, the majority of the employers understand their reporting obligations and the importance of knowing about disciplinary outcomes. However, when considering a hypothetical situation involving a nurse with a discipline order, only 18% of

TABLE 1

Attitudes and Perceptions: Remediation and Return to Safe Practice (*N* = 1,285 to 1,292)

Statement	Somewhat or Strongly Agree
It is important for the nurse practicing with a discipline order to review the professional standards and guidelines to help improve his or her practice.	98%
The nurse should meet with a nursing expert to discuss his or her discipline order and develop ways to prevent the conduct from occurring again.	98%
Employers can participate in discipline monitoring by auditing the nurse or providing supervision.	97%
Employers' participation in discipline monitoring can be effective in helping the nurse return to practice.	95%
Supervising the nurse and conducting random audits of his or her practice is effective in helping the nurse return to practice safely.	94%
I understand what the College* expects of me with respect to monitoring the nurse.	91%
Mentoring can help the nurse learn from his or her former errors.	90%
This discipline order protects the public.	89%
I am confident that I could carry out my role regarding this discipline order if I were the supervisor.	89%
I know whom I can contact at the College if I need support regarding my supervision of the nurse.	72%
The nurse could return to nursing practice safely after being the subject of this discipline order.	54%
My workplace will support my decision to hire the nurse and provide me with resources I require.	39%
I would be willing to hire the nurse even though he or she is the subject of this discipline order.	18%

*The "College" refers to the regulatory body the College of Nurses of Ontario.

respondents reported that they would hire such a nurse, and low proportions reported confidence that the nurse in the hypothetical scenario could safely return to practice and that support and resources would be available to transition the nurse to practice (54% and 39%, respectively). One respondent wrote that her "organization would be hesitant to hire a nurse with proven clinical gaps when there are nurses available to be hired that do not have restrictions or...learning plans." Another respondent explained that employers "play an important role in monitoring discipline orders," but the challenge is the time required to monitor and report on practice issues.

Significant numbers of the respondents were unsure about how the hypothetical case would unfold in their settings: 39% said they neither agreed nor disagreed that they would be willing to hire the nurse, and another 14% said they did not know whether they agreed or disagreed. Similarly, 39% of respondents said they neither agreed nor disagreed that they would be willing to hire the nurse and another 14% said they did not know whether they agreed or not with that statement. Similarly, 41% of the respondents neither agreed nor disagreed or did not know how they felt about the statement with regards to the nurse's ability to return safely to practice after a discipline order. Finally, 40% said they neither agreed nor disagreed or did not know whether they agreed that their workplace would provide resources to support the nurse's supervision.

Almost one-third of respondents did not express an opinion regarding whether discipline monitoring would be possible in their setting. For instance, 28% of the respondents did not voice an opinion about whether or not discipline monitoring would require excessive staff resources. One respondent commented that she was unsure of "what resources would be needed" to provide effective monitoring and that monitoring could require "extra staff and time." Moreover, 29% did not express an opinion about whether participating in discipline monitoring would disrupt workflow. Although no significant associations were found between survey responses and facility or setting type, two respondents stated that in small agencies and long-term care, expertise, time, and staff can be limited, which can make discipline monitoring difficult.

Experience Monitoring Discipline Orders

Comparisons of respondents who had experience managing nurses with discipline orders versus those who did not have such experience and comparisons of respondents from the three major types of practice settings (hospitals, long-term care, and other settings such as clinics and community settings) were conducted. The sample sizes were relatively large, and the comparisons were numerous; therefore, even differences across groups at a significance level of $p < .05$ were interpreted with caution. Relatively few differences between respondents with and without experience were found, though employers with experience were more likely to know whom to contact at the regulatory body for assistance (78% vs. 70%) and when and what to report to the regulator (87% vs. 82%). Unexpectedly, employers who had experience

TABLE 2

Situational and Contextual Factors: Legal Requirements and Constraints in Relation to a Hypothetical Situation (*N* = 1,283 to 1,292)

Question	Somewhat or Strongly Agree
I understand why the College requires the nurse to report the outcome of her discipline order.	97%
I know when and what I should be reporting about the nurse's practice and conduct to the College.	84%
It is clear to me who should be responsible for monitoring the discipline order at my organization.	80%
Monitoring the discipline order requires too many staff resources.	21%
Participating in monitoring the discipline order disrupts employees' workflow.	19%
I do not have the skills and experience to effectively monitor a discipline order.	6%

with nurses working with discipline orders were consistently less positive about the process. For example, employers with experience monitoring discipline orders were considerably more likely to report that involvement would disrupt workflow (24% vs. 16%, $p = .001$). Overall, differences by setting were small and only statistically significant for a minority of items. Findings did not suggest that employers from long-term care and other nonhospital settings felt especially burdened by the prospect of implementing discipline orders. The limited patterns that were identified suggested that hospital-based employers, who seemingly would have more resources, were less positive about the discipline process and their ability to participate in it.

Need for Training

Even though the majority of the respondents felt that they had the skills necessary to provide discipline monitoring, 83% felt that they and others at their facility required training. One respondent explained that it would be helpful to have "clear guidelines about what to report" in the form of a template, and another explained that she would expect the discipline order would be "clear." Of the total 1,648 respondents, 58% preferred online training in the form of learning modules or a webinar; 57% expressed a preference for in-person training; and 41% thought written materials were needed to address learning needs in this area.

Implications and Conclusions

In this study, attitudes and perceptions about discipline monitoring, situational and contextual factors that impact participation in discipline monitoring, and the needs and preferred modes of training and education were described by employers from a large Canadian jurisdiction. The response rate of 56%, which was nearly double the expected rate, indicates the employers' interest in the subject and the feasibility of using a short, focused online survey at a time of skepticism about response rates in survey research.

Because of this study, the College now has baseline data and an awareness of employers' attitudes and perceptions and an understanding of situational and contextual factors that impact employers' ability to participate in discipline monitoring. Similarly, the regulatory body is able to develop focused education and training based on the preferences of employers who participated in this study. Specifically, the results suggest that programs should focus less on the general philosophy of remediation, discipline orders, and the idea of employer participation. Instead, they should directly address practical issues and concerns, especially those related to attitudes toward hiring nurses with discipline orders and the feasibility of integrating nurses with practice restrictions into their staff.

Although the respondents were generally positive about discipline orders, they were divided when presented with a specific case and asked about their ability to deal with it, their resources for dealing with it, and the possibility of remediation for a specific type of practice issue. Fewer than 20% of employers indicated that they would be willing to hire a nurse with a common practice problem for which remediation is hypothetically possible. Interestingly, employers in hospitals, which typically have more resources, were not more positively disposed to being involved in monitoring discipline orders, nor were employers who had previous experience working with a nurse with a discipline order. These findings suggest that deep-rooted beliefs and perceived organizational constraints may have important influences on reintegrating disciplined nurses. Further research can be conducted with employers to better understand their attitudes as well as barriers that might exist. While it may be easier for regulators to address organizational barriers, it may be necessary to also address fears and concerns.

This study provides practical considerations for regulators and a basis for future collaboration with employers involved in this process. Anecdotally, it is the authors' understanding that many regulators intend to call on employers more frequently to assist with monitoring and enforcing discipline orders; however, the researchers are not aware of any previous surveys of employers regarding their engagement in monitoring programs.

The results of this study should stimulate regulators seeking to partner with employers in the discipline monitoring process to ask more questions and problem solve rather than assume

that generally positive attitudes will easily translate into allocating the resources needed to address the challenges that disciplined nurses may face in reintegrating into the workforce.

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