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Final Report:

**FACTORS THAT IMPACT THE DETERMINATION BY MEDICAL EXAMINERS OF
ELDER MISTREATMENT AS A CAUSE OF DEATH IN OLDER PEOPLE**

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Table of Contents

Participants	3
Introduction	5-7
Phase I: Medical Examiners' Survey	8-21
Phase II: Geriatrician's Review of Case Conferences and Records	22-34
Phase III: Scene Investigation Study	35-44
Phase IV: Pilot Study: Cross of Adult Protective Service and Medical Examiner Databases	45-56
Conclusion	56-58
References	59-60
Appendix A: Death Scene Investigation Form	61-73

FACTORS THAT IMPACT THE DETERMINATION BY MEDICAL EXAMINERS OF ELDER MISTREATMENT AS A CAUSE OF DEATH IN OLDER PEOPLE

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FACTORS THAT IMPACT THE DETERMINATION BY MEDICAL EXAMINERS OF ELDER MISTREATMENT AS A CAUSE OF DEATH IN OLDER PEOPLE

INTRODUCTION

Elder mistreatment is a major public issue that afflicts many community-dwelling older adults aged 60 and over. The National Elder Abuse Study revealed that more than 5 million older adults in the United States were abused, neglected and/or experienced self-neglect in 1996.¹ This study also revealed that almost 80% of the cases of elder abuse, neglect, and/or self-neglect are unreported. Potential risk factors for elder mistreatment include advanced age, female gender, poverty, and cognitive or functional impairment. Importantly, victims of elder mistreatment experience three times the mortality rate of elders never reported to Adult Protective Services (APS).²

In October of 2001, the Department of Justice convened a roundtable entitled “Elder Justice: Medical Forensic Issues Concerning Abuse and Neglect. The report acknowledged the lack of research in elder mistreatment and called for more accurate data on the causes and risk factors leading to death.^{3,4} Unlike child abuse, where medical examiners have identified a number of forensic markers, there are no such data available for deaths due to elder mistreatment. The picture is further clouded as no guidelines exist to help medical examiners distinguish signs of elder mistreatment from the ravages of old age or disease.

The National Institute on Aging (NIA) requested the National Research Council (NRC) convene a panel of experts to assess the current state of elder mistreatment research and to formulate recommendations for a research agenda. The NRC report entitled “Elder Mistreatment: Abuse, Neglect and Exploitation in an Aging America” called for research on the forensic aspects of elder abuse including lethality risk factors.⁵ In the report the panel defined elder

mistreatment as “(a) intentional actions that cause harm or create a serious risk of harm, whether or not intended, to a vulnerable elder by a caregiver or other person who stands in a trust relationship to the elder or (b) failure by a caregiver to satisfy the elder's basic needs or to protect the elder from harm”.⁵ This comprehensive work by the NRC described the lack of rigorous published research in the area and outlined the needs of the field; the cause of deaths in mistreated elders was one of the essential issues in need of further research.

Currently, the cause of death and forensic markers of elder mistreatment (EM) are largely unknown.^{1,2} Those who work in the field believe that the state of medical knowledge and forensic science regarding elder abuse and neglect is equivalent to that of child abuse and neglect three decades ago and domestic violence 10 to 15 years ago.⁶ One reason for this is that APS investigations, as well as the work of practicing physicians or other health care professionals end at the time of death. Consequently, the professionals most suited to determine death due to EM and the causes are medical examiners and coroners.* However, medical examiners rarely deem EM as a cause of death; this is likely due to a lack of research and evidence to support this determination. In response, the current project was undertaken to begin to develop primary data and a literature base on the topic of death due to EM.

Death determinations by medical examiners or coroners are based on data from three general sources: 1.) The autopsy or external examination, 2.) Medical records and toxicology and 3.) The scene investigation. The research team conducted four distinct projects to evaluate these three aspects of death determination by medical examiners:

- Phase I was a survey exploring the views of medical examiners concerning all three areas of death determinations.

- Phase II evaluated scene investigation and medical records and toxicology by studying the medical examiners case conferences and case records.
- Phase III was a study of the scene investigation.
- Phase IV explored autopsy and physical examination findings.

The studies conducted in each phase were distinct from the others and each had varying methods, data analyses and results. Each phase is presented distinctly with an overview describing the study followed by the methods, results and discussions to assist the reader.

This series of pilot studies provides both interesting and novel findings and confirms findings from other reports. The results of each of these studies offers pilot data that inform readers of the factors that account for the low rate of determination of elder mistreatment as a cause of death in older persons. It is the hope of the authors that these studies not only increase understanding of EM death determinations but also lay the groundwork for future research by a wide variety of disciplines including prosecutors, police officers, protective service workers and medical examiners.

**(In Houston, the Harris County Medical Examiners Office employs medical examiners and not coroners, thus, for the purpose of this report the term medical examiners will be used; however, many of the findings would apply to both medical examiners and coroners.)*

Phase I: Do Medical Examiners Determine Elder Mistreatment as a Cause of Death?

Overview

Despite a significant prevalence of elder mistreatment and the associated increased mortality, elder mistreatment may be rarely identified as a cause of death by medical examiners. Although primary care physicians or other physicians caring for the patient at the time of death are often responsible for determining the cause of death, this role is frequently left to the medical examiner. Medical examiners or forensic pathologists, therefore, play a key role in identifying elder mistreatment, especially in cases involving criminal abuse or neglect.

This present study was part of a larger project called “Factors that impact the determination by medical examiners of elder mistreatment as a cause of death in older persons” funded by a grant from the Department of Justice/ National Institute of Justice to the Texas Elder Abuse and Mistreatment (TEAM) Institute, which is an interdisciplinary collaboration with the Texas Department of Protective and Regulatory Services, Division of Adult Protective Service (APS) and the Baylor College of Medicine Geriatrics Program at the Harris County Hospital District. TEAM researchers partnered with the Harris County Medical Examiner’s Office to achieve the goals of the project. The objective of this phase of the study was to examine the medical examiner’s decision-making processes involved in determining elder mistreatment as a cause of death in older persons.

Methods

TEAM researchers developed a survey. After obtaining approval from Baylor College of Medicine’s Institutional Review Board (IRB), the Harris County medical examiners were surveyed in 2004. Small groups of medical examiners completed the survey in the presence of one of two geriatricians. The geriatrician read through the questions in the survey and clarified

the questions for the participants. The survey consisted of questions to the medical examiners regarding their length of practice, age, and experience in other medical specialty. The survey also contained questions regarding the medical examiners' decision making process in determining elder mistreatment as a cause of death, factors used by the medical examiners to determine elder mistreatment, and the presence and usefulness of information provided to them in identifying elder mistreatment.

Results

All eleven medical examiners completed the survey. The first set of questions pertained to information about the medical examiners. Seven out of the eleven (64%) medical examiners had five or fewer years of practice as a medical examiner. Two out of the eleven (18%) medical examiners had 6 to 10 years of practice. Two had more than 10 years of practice. Three out of the eleven (27%) medical examiners had experience in another medical specialty or profession. Six out of the eleven (55%) medical examiners were in the age group 31-40, one out of 11 (9%) in the age group 41-50, and 4 out of 11 (36%) in the age group 51-60. The medical examiners were asked to rate their workload using a scale of 1 to 10 with 10 representing the heaviest workload. Eight of eleven (73%) medical examiners rated their workload as 9-10, and 3 (27%) medical examiners rated their workload as 7-8. Eight of eleven (73%) medical examiners did not report elder abuse or neglect over the previous 12 months. Three (27%) medical examiners reported elder abuse and/or neglect 1-5 times over the previous 12 months.

The next set of questions pertained to factors relevant in determining elder mistreatment. Table 1 lists the "single most relevant factor in determining elder mistreatment" reported by the medical examiners. Table 2 lists other relevant factors in determining elder mistreatment. One out of the eleven medical examiners routinely order toxicology, and ten out of eleven ordered

toxicology only if deemed appropriate. One of eleven medical examiners routinely order drug and alcohol screen. Eight routinely check medications. Table 3 lists factors, which lead to difficulty in determining elder abuse or neglect.

The next set of questions pertained to the presence and value of historical and clinical information used by the medical examiners in determining elder abuse and/or neglect. Figure 1 depicts the usefulness of medical records. Figure 2 depicts the availability of information that assists in identifying the potential for elder abuse and/or neglect. Figure 3 depicts the serviceability of scene investigation reports.

Discussion

In this study classification as death due to EM was made by medical examiners when EM was determined to be the sole cause of death or a contributory factor. Our survey showed that medical examiners infrequently determine elder mistreatment as a cause of death in older decedents. Diseases of aging and physiology attributed to aging create barriers to determining elder mistreatment. Older adults commonly suffer from major disease processes such as cardiovascular and cerebrovascular diseases and cancers. Older adults are susceptible to events such as falls and adverse reactions to medications that may lead to injury. They are also susceptible to developing conditions that represent diminished reserve such as malnutrition, dehydration, osteoporosis, and cognitive impairment. All of these conditions can potentially mimic or mask markers of abuse or neglect, complicating postmortem evaluation of older decedents.⁶ Because these conditions are common among elders, unlike younger persons and especially children, older adults are expected to die. Elder deaths therefore may be infrequently scrutinized to the extent that would occur with a younger person's death.

Other major barriers for medical examiners in determining elder mistreatment pertain to the information available to them. Medical records often do not provide adequate information for the medical examiners to determine elder mistreatment as a potential contributing factor to the death. This lack of information in the medical records documenting potential abuse or neglect is consistent with the low reporting rate among physicians. Rosenblatt, et al.⁷ analyzed the state of Michigan records of reported cases of suspected elder abuse and found that physicians reported 2% of cases. Kennedy⁸ randomly surveyed 250 family physicians and 250 general internists in the state of Ohio. Seventy-eight percent responded to the questionnaire, detailing their experience, knowledge, and attitudes towards elder mistreatment. Less than 2% of the responding physicians reported suspected elder mistreatment cases to APS. The findings in this survey underscored the current, ongoing failure by physicians to recognize many cases of potential abuse and neglect despite increased awareness of elder mistreatment in the past thirty years and laws mandating physicians to report suspected cases to an adult protective service agency. In Kennedy's survey, 98% of physicians advocated more education about elder mistreatment.⁸ As part of educating physicians about elder mistreatment, better documentation of findings such as bruises, lacerations, pressure ulcers, and social situation should be included.

The scene investigation report is a crucial source of information for the medical examiner in determining elder abuse or neglect and, in many cases, may be the only information available for the medical examiners beside the postmortem evaluation. Our survey, however, suggested a lack of overall information that would assist in identifying the potential for abuse and/or neglect. Almost half of the medical examiners reported that such information was "sometimes present", three of 11 medical examiners reported "seldom present", and one medical examiner reported "never present". When the medical examiners were specifically asked about the helpfulness of

“scene information”, only six reported that it was helpful “all the time”. Strategies to improve education of scene investigators from both police departments and medical examiner’s offices regarding elder mistreatment may improve gathering of scene information necessary for the medical examiners to determine elder mistreatment.

The medical examiners listed relevant factors in determining elder mistreatment comprising patterns and distribution of injuries, discrepancies between history and injuries, malnutrition, pressure ulcers, skull fractures, and poor hygiene. These factors are potential clinical and forensic markers indicating abuse and neglect.⁶ Epidemiologic research is needed to further explore risk factors for death and should encompass those markers that are most commonly associated with death in victims of elder mistreatment. To ensure better certification of elders’ deaths, researchers should document aspects of aging that are natural and compare them with features of injury due to accidental mechanisms or to the possibility of criminal abuse or neglect. Currently, the most common manner of death cited when elder mistreatment is noted is homicide when associated with physical abuse and natural death when neglect is the cause. Scientific literature on all markers and risk factors of death due to elder mistreatment would support a medical examiner’s determinations and conclusions when challenged in court.⁶

Medical examiners and coroners should exchange information with geriatricians and other specialists. Such educational contributions should include being active members of multidisciplinary teams to review deaths, review reporting mechanisms, and identify system issues that either enhance or undermine adequate reporting and intervention. There are numerous fatality review teams around the US that examine deaths due to child abuse and domestic violence. In the last few years elder abuse fatality review teams have been established nationally in at least eight sites.⁹ In fact, the Department of Justice provided seed funds through the

American Bar Association to support four teams. Although the teams differ somewhat due to state laws and local resources, most examine elder deaths in order not only to improve systems such as APS or medical reporting, but also to prevent similar deaths. These typically include, but are not limited to Adult Protective Service staff, geriatricians, medical examiners, law enforcement personnel, victim advocates, and prosecutors. A replication manual describing the eight teams and their processes is available on-line.⁹

In addition to research and elder abuse fatality review teams, enhanced training in the recognition of signs and typical features of abuse and neglect is important for medical examiners, coroners, death investigators, law enforcement personnel, and first responders to emergency calls reporting deaths. Clearly this same training is appropriate for all health professionals.¹⁰ Development of standardized protocols for examination of deaths in elders, particularly when there is a suspicion of abuse or neglect, could be accomplished with the expertise of Adult Protective Service workers and all health care professionals, especially those primarily involved with frail and vulnerable elders.

Conclusion

Medical examiners infrequently determine elder mistreatment as a cause of death in older decedents. Chronic diseases and features of aging confound the picture and significantly complicate the determination whether death resulted from abuse or neglect. Medical records and other information, including scene investigation reports, are often inadequate in providing information, which may aid medical examiners in determining elder mistreatment or abuse. Prosecutors are hampered by lack of forensic evidence, which includes equivocal medical examiner determinations after autopsy. Possible solutions include research on forensic markers and risk factors for death due to elder mistreatment, more county- or state-based elder abuse

fatality review teams and increased elder mistreatment education for health professionals, medical examiners, coroners, death investigators, law enforcement and justice of the peace.

Table 1

Single Most Relevant Factor in Determining Elder Mistreatment by Medical Examiners

- “No single factor”
- Malnutrition
- Inconsistent injuries/ pattern and distribution of injuries
- Trauma consistent with abuse
- Designated caregiver

Table 2

Other Relevant Factors in Determining Elder Mistreatment by Medical Examiners

- Poor personal hygiene
- Advanced pressure ulcer
- Injury with lack of explanation
- Inappropriate medication
- Degree of independence/ autonomy
- Malnutrition
- Lack of medical care
- History of noncompliance with medical advice
- Skull fracture

Table 3

When Medical Examiners Find it Difficult to Decide that Elder Abuse and/or Neglect Lead to Death

- Debilitated patient with chronic diseases
- Failure to thrive
- Results of investigation equivocal
- When no explanation satisfactorily fits findings
- Frequent falls due to disability
- Dementia
- End stage disease
- Life threatening conditions
- Difficult to determine the degree of responsibility of the caretaker
- When injuries not present
- Asphyxia death
- Lack of uniform definition of neglectful caregiver
- Poorly documented medical evaluation

Figure 1

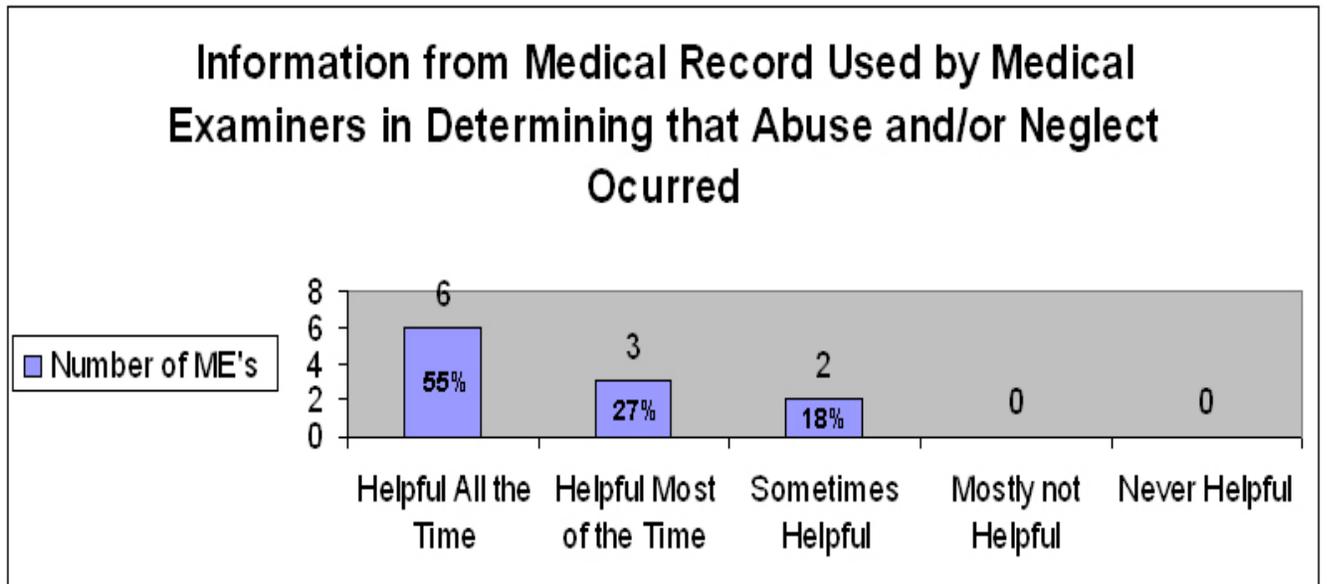


Figure 2

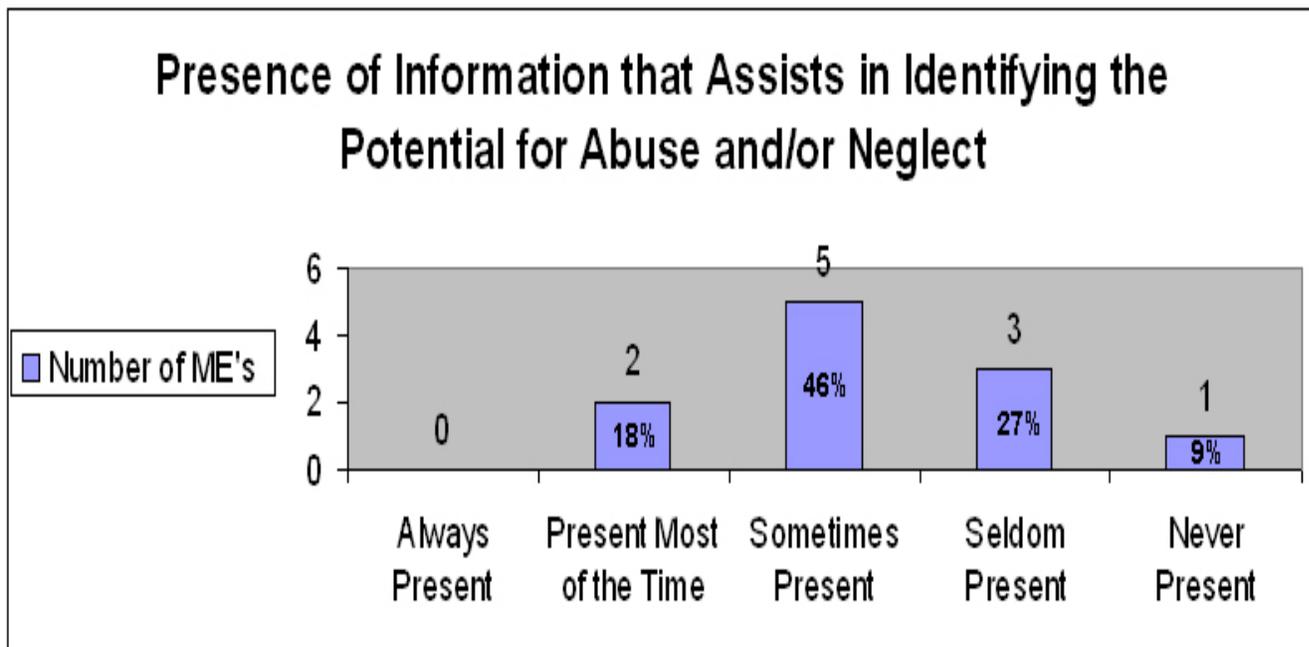
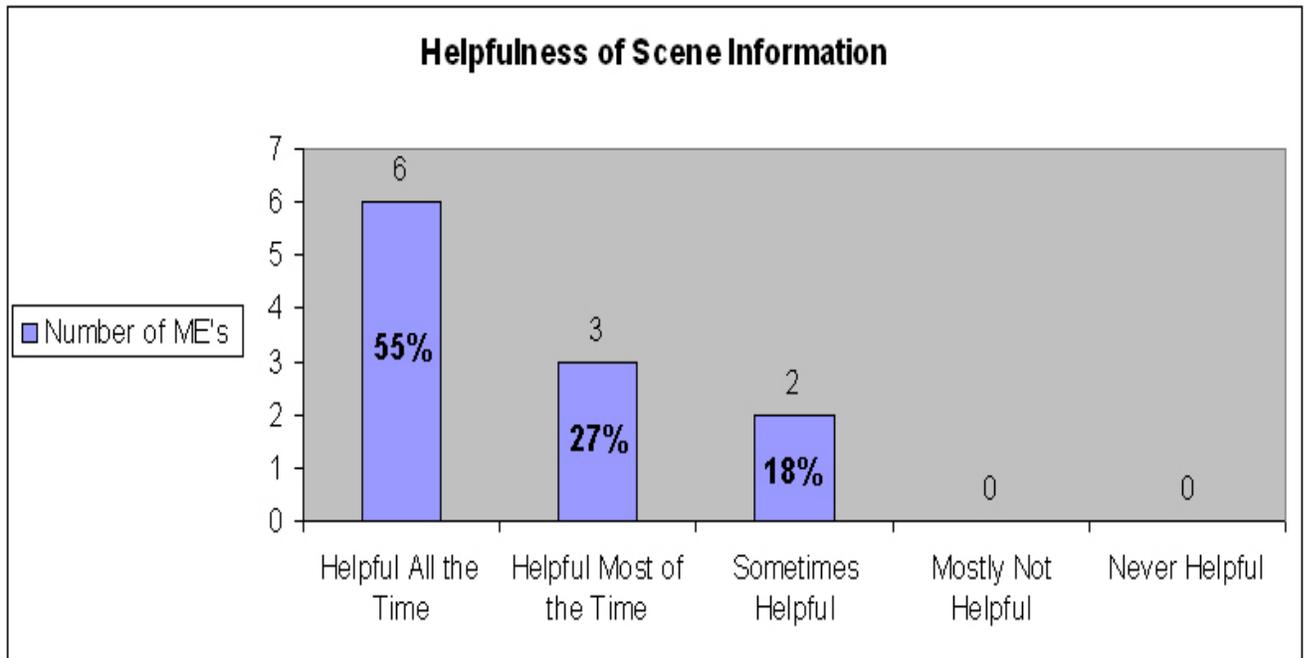


Figure 3



Educational Box

- Medical examiners infrequently determine elder mistreatment as a cause of death in older decedents.
- Chronic diseases and features of normal aging complicate the determination whether death resulted from abuse or neglect.
- Strategies to heighten education of clinicians and scene investigators regarding elder abuse and neglect are needed to improve detection, gathering of information, and documentation of findings associated with elder mistreatment.
- Research is needed to further explore risk factors and markers for death in victims of elder mistreatment.

Phase II: Does Geriatric Expertise Facilitate the Work of the Forensic Pathologist in Identifying Cases of Elder Mistreatment?

Part 1: Attendance at daily case conferences

Part 2: Review of elder death records

Overview

Phase II of the current project explores the possibility of geriatric consultation to medical examiners for the purpose of assisting these forensic pathologists in deciphering the difference between the natural history of diseases of old age and premature death due to elder mistreatment. Geriatricians are by definition experts in the care of older living patients. The geriatricians who participated in this study (LCK, CBD) were experienced geriatricians with expertise in elder mistreatment intervention. The hypothesis was that an experienced geriatrician would be able to provide the medical examiner with a clearer picture of normal aging versus disease versus mistreatment and result in better identification of elder mistreatment as cause of or contributor to death.

Methods

Study Design

Phase II of the current study was conducted at the office of the Harris County Medical Examiner (HCMEO) and had two parts. Part 1 consisted of attendance by a geriatrician at the HCMEO morning meeting where the investigator assigned to the case discusses cases that occurred in the prior 24 hours and a determination is made to either perform an external examination or a full autopsy. The forensic pathologists, forensic nurses, other forensic investigators, and toxicologists attend these daily meetings. One of two geriatricians attended 36 conferences discussing cases reviewed by the medical examiners at the HCMEO. On some days there were no elder deaths on others, several. The geriatricians attended as many conferences as

needed to obtain data on 36 cases. A geriatrician reviewed 36 death records to complete the second part of Phase II. Inclusion criteria for the 36 records reviewed was age ≥ 65 years at the time of death.

For Part 1, the geriatricians recorded notes on all cases of decedents that were ≥ 65 years of age. A data collection sheet developed for this project was used for data collection. (Figure 1) For Part 2, the geriatricians reviewed the entire record and made notes on the presence or absence of risk factors and forensic markers known to be associated with elder mistreatment.

Data Analysis

Descriptive data was obtained for both parts of the study. Data in Part 1 was derived from the standard data collection sheets. Data in Part 2 was extracted exclusively from the HCMEO death records. Age, race, gender and living situation (i.e. home, nursing home etc.) were attained as part of the demographic variables in both Part 1 and Part 2. Other descriptive data related to each individual's place of death, number of medications, circumstances of death, presence of health care provider, description of home environment and type of medical examiner evaluation were also collected for both Part 1 and Part 2. Additional variables reported in Part 2 of the study were available through individual evaluation of the death records. These variables included toxicology results, x-ray reports, findings from the medical records available for the decedents and the final determination of cause and manner of death.

Based on the results in both Part 1 and Part 2 of the study a determination was made by the geriatrician about whether or not enough of the risk factors and forensic markers of elder mistreatment were present to determine if the death was caused by elder mistreatment.

Results

PART 1: Attendance at daily case conferences

Twenty-one or 58% of the cases were male and 47% were Caucasian. The average age of the group was 75 years with a range from 65 to 91. Seventy-five percent of the cases were living at home at the time of death. A more detailed demographic profile of this group is provided in Table 1. The analysis of the place of death showed that 44% of the decedents died at home. Only 10(28%) had available data documenting treatment by a primary care physician. Two or 6% were found to be taking no medications at the time of death; the remainder was taking 1-3 medications.

The circumstances for death were classified into 13 categories and are described in Table Two. The most frequent circumstances for death in this group were falls (28%), unresponsive (14%) and collapse (11%). Additionally, 22(61%) underwent a physical exam by a medical examiner while 12(33%) underwent an autopsy. Review of the data showed that the environment of the homes visited by investigators was not described.

The result of the geriatric consultation found that 19(53%) of the cases were unlikely to be due to elder mistreatment and 9 or 25% of the cases were deemed inconclusive. However 8 of the 36 (22%) cases discussed in the morning HCMEO conference were likely to be due to elder mistreatment. Of those, 4 (11%) were possibly due to self-neglect, 2(6%) were possibly due to caregiver-neglect and 2(6%) were possibly due to general mistreatment. Table 2. provides a more descriptive analysis of the data.

PART 2: Review of Elder Death Records

The analysis of Part 2 showed that 26(72%) of the decedents reviewed were female and the majority, 27(75%) were Caucasian. The average age for the group was 80.9 years with a

range from 65 to 92. The analysis of the living situation for each person at the time of death showed that 29(81%) lived at home. Group-wide demographics are reported in Table 3.

Descriptive analyses of place of death revealed that 18(50%) of the deaths were reported to have occurred at the hospital while 14(39%) of the individuals died at home. Twenty-two or 61% of the individuals were reported to have received care from a primary care physician while 11(31%) were not reported to have a source of primary care.

Analyses also showed that only 14(39%) of the death records provided adequate data for determining medication usage. The range for the number of medications reported was 1 to 15. Only 5(17%) of the 29 homes where the decedent died were described in the investigator reports. Of these homes 3(60%) were described as neat and orderly, 1(20%) was described as cluttered and smelled of cat urine and 1(20%) was described as unkempt, several cats and dogs and smelled of urine.

The circumstances of death were placed into 8 categories with falls 17(47%), unknown 6(17%) and cardiac event 4(11%) contributing to 75% of the deaths. The cause of death was reviewed in each record and it was determined that 89% of the deaths resulted from 14(39%) atherosclerotic disease, 10(28%) fracture related injuries and 8(22%) brain injury. Seventy-eight percent of the deaths were determined by physical exam and 8(22%) were determined by autopsy reports. Toxicology screening was completed on 11(31%) of the decedents with the majority 10(91%) providing negative results. As a result of the chart reviews 4(11%) of the cases were determined to have been probably related to elder mistreatment. Table 4. provides a more detailed description of these data.

Discussion

Medical examiners are trained in forensic pathology and are expert in the interpretation of pathological findings at death due to a variety of disease states and injuries. Geriatricians on the other hand are expert in the care of the living patients. In the same way that it may be difficult for a geriatrician to interpret pathological findings, so too is it difficult for the medical examiner to know the various standards of care for living elderly patients and how to distinguish normal aging and disease in old age from the ravages of elder mistreatment. It seems quite natural that forensic pathologists could consult with geriatricians to help make this distinction, which in many cases might be difficult or nearly impossible to make from just the physical examination or autopsy.

For example, the scene investigations in Part 1 showed that of the decedents taking medication the range was 1-3 drugs. This is very unusual as the average for older individuals nationally is 34.4.¹¹ This fact known very well by geriatricians suggests that the investigators obtained or were provided with incomplete data concerning medication use. Since perpetrators could poison elder mistreatment victims with prescription medications, the determination of all the medications in the victims home is necessary to guide the medical examiner and toxicologist. Note that in Part 2, where the entire record was reviewed that the number of medications taken was much higher than reported in the 36 cases reviewed at the daily conference.

In studies by the Texas Elder Abuse and Mistreatment Institute or TEAM, researchers have shown that inspection of the environment is important in cases of caregiver and self-neglect.¹² TEAM researchers believe that an unkempt physical environment is a marker of elder mistreatment. The physical environment was not described in any of the cases in Part 1, however in Part 2 the environment was described in the more complete MEO record.

The circumstances of death noted by investigators were falls, being found unresponsive and collapse while the causes of death determined by the medical examiners was falls, unknown and cardiac disease. These seem to address the immediate cause of death, however, it is unclear if mistreatment lead to the final event. For instance if an elder is overmedicated he might collapse or fall. Or if the elder is denied medical care like physical therapy (and only a minority of decedents in this study were receiving primary care) he or she might be more prone to a fall. The majority of seniors over the age of 65 have atherosclerotic heart disease so it is not surprising that many of the cases were felt to be due to heart disease, however overmedication might lead to an arrhythmia and look to the medical examiner like a natural event. These findings suggest that an isolated examination of a dead body, in many cases might not tell the whole story and the care of the decedent while he or she was alive should be a part of the determination of cause of death.

The geriatricians determined that 23% of the cases reviewed at the morning case conference could have been due to elder mistreatment and 11% of the case records reviewed were likely due to elder mistreatment.

Limitations

When regarding the data presented in both parts of this preliminary study there are certain limitations that should be considered. First, the data presented were collected from the HCMEO only and therefore, this data may not be representative of other medical examiner sites. Second, the sample reported in both phases were small and no sampling strategy was used to assure proper randomization in phase 1. Third, the presence of an expert geriatrician during the morning conferences may have created a Hawthorne Effect. The Hawthorne Effect reflects a good-subject tendency in which the participants in a study know that they are being studied and thus adapt

their responses to align with the study's expectations. Consequently, the presence of a geriatrician in the morning conferences may have influenced certain discussions resulting in added information that might not be standard during morning conferences.

The results of Phase 2 of this project suggest that at least some cases of death due to elder mistreatment cannot be determined by physical examination or autopsy alone, and that examination by a geriatrician of the medical records and other data of the decedent prior to death may be necessary. The results also indicate that better delineation of forensic markers and risk factors for death due to elder mistreatment are needed to guide both medical examiners and investigators.

Table 1. Demographics Collected During Daily Case Conferences

Age (Range, Mean)	65-91 (75)
Gender (n, %)	
Male	21 (58)
Female	15 (42)
Race (n, %)	
Non-white	19 (54)
White	17 (46)
Living Situation (n, %)	
Home	27 (75)
Nursing Home	2 (5)
Unknown	7 (20)

Table 2: Medical Data Collected During Daily Case Conferences

Place of Death (n, %)

Home	16 (45)
Hospital	13 (36)
Unknown	7 (20)

Primary Care (n, %)

Present	10 (28)
None	2 (5)
Unknown	24 (67)

Circumstances of Death (n, %)

Falls	10 (28)
Unresponsive	5 (14)
Collapse	4 (11)
Hospice	3 (8)
ETOH	2 (5)
Suicide	2 (5)
Shortness of Breath	1 (3)
Metastatic Cancer	1 (3)
Chest Pain	1 (3)
Multiple Opiates	1 (3)
Back pain and sweating	1 (3)
Poor healing skin graft	1 (3)
Unknown	4 (11)

Medical Examiner

Evaluation (n, %)

Physical Exam	22 (62)
Autopsy	12 (33)
Unknown	2 (5)

Elder Mistreatment (n, %)

Unlikely	19 (54)
Poss. Self-neglect	4 (11)
Poss. Caregiver-neglect	2 (5)
Poss. General Mistreatment	2 (5)
Unknown	9 (25)

Table 3. Demographics Retrieved During Death Records Review

Age (Range, Mean)	65-92 (81)
Gender (n, %)	
Male	26 (72)
Female	10 (28)
Race (n, %)	
White	27 (75)
Non-white	9 (25)
Living Situation (n, %)	
Home	29 (80)
Nursing Home	5 (14)
Assisted Living	1 (3)
Personal Care Home	1 (3)

Table 4: Medical Data Retrieved During Death Records Review

Place of Death (n,%)	
Home	14 (40)
Hospital	18 (50)
Nursing Home	2 (5)
Outdoor	2 (5)
Primary Care (n,%)	
Present	22 (61)
None	11 (31)
Unknown	3 (8)
Circumstances of Death (n,%)	
Falls	17 (48)
Cardiac Event	4 (11)
Shortness of Breath	3 (8)
Suicide	2 (5)
MVA	2 (5)
Unresponsive	1 (3)
GI Virus(refused care)	1 (3)
Unknown	6 (17)
Causes of Death (n,%)	
Atherosclerotic Disease	14 (40)
Fracture related	10 (28)
Brain Injury	8 (22)
MVA	2 (5)
Suicide	2 (5)
Cocaine	1 (3)
Medical Examiner Evaluation (n,%)	
Physical Exam	28 (78)
Autopsy	8 (22)
Toxicology (n,%)	
Not Done	25 (69)
Negative	10 (28)
Positive	1 (3)
Elder Mistreatment (n,%)	
Undetermined	32 (89)
Neglect	4 (11)

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Figure 1. MEO Case Report Form

MEO Case Report Form

Date _____	Gender ___ M ___ F
Age _____	Race/Ethnicity ___ W ___ B ___ H ___ As ___ Other
Living situation: ___ NH ___ ALF ___ Home ___ PCH ___ Homeless	
Expert MD _____ KIM _____ CBD _____	

Circumstances of Death

Scene Investigation

Discussion

Figure 1. Continued

Evidence of EM discussed by group	Y	N

Expert MD's assessment of possible EM

MEO Decision _____ PE _____ Autopsy

Comments

1. Was decision different?
 - a. Manner of death + Cause of death
 - b. PE vs. Autopsy
2. Was it helpful to MEO's?
3. Time spent (MD)?

Phase III: Scene Investigation Study

Overview

Data collected at the death scene provides information that can be used in determining the cause and manner of death, including factors related to elder mistreatment. In Phase III of this project the data collected by a death scene investigator from the Harris County Medical Examiner's Office was compared with those collected by a specially trained member of the research group during the scene investigation of deceased elders. The purpose was to determine the factors utilized by the scene investigator to describe the circumstances of death.

Methods

Study Design

In phase III of the current study a trained researcher from Baylor College of Medicine (BCM) accompanied Harris County Medical Examiners Office investigator(s) on 17 death scene investigations. The death scene investigations were deaths that occurred at the home of residents of Harris County and who were 65 years of age or older. When a death required an investigation by the medical examiner's office and consisted of an elder 65 years or greater, a trained researcher was alerted and would meet the investigator within 15 minutes of the call. The BCM researcher accompanied the investigator throughout the course of the death scene investigation while collecting data independent of the investigators notes. Portions of the data collected by the BCM researcher and that of the investigator were compared and analyzed.

Data Analysis

Descriptive statistics were used to analyze the data collected at each scene. Demographic and forensic classification variables consisted of age, race, gender, living situation, cause of death, manner of death and type of forensic analysis conducted. Information on other variables

including body description at the scene, impairments, personal hygiene, environmental condition, medication and alcohol abuse was collected and analyzed. A geriatrician, a gerontological nurse practitioner and a research assistant conducted a qualitative review of the data.

Results

Analysis of the demographic data shows that 9(53%) of the sample were male and 12(71%) were white. The age range for the group was 65-94 with a mean of 75 years. Analyses of living situation revealed that 7(41%) of those investigated were living alone. The most frequently determined cause of death 8(47%) was hypertensive atherosclerotic cardiovascular disease. The majority of the deaths 10(59%) were considered to be natural. Fifty-three percent of those investigated received only a physical examination. Group-wide demographics are presented in Table 1.

Outlined in Table 2 the data revealed that 100% accuracy was achieved by the death scene investigators when evaluating the decedents for the presence and absence of forensic body markers such as lacerations, bruises, decubitus ulcers, malnutrition, dehydration, abrasions, restraints evidence of past use of restraints and burns and the reporting of these markers. According to the investigator and researcher reports 4(57%) of 7 individuals with valid data associated with their activities of daily living (ADL) were found to be independent in ADL function. Similarly 4(67%) of 6 with valid data related to instrumental activities of daily living were noted to be independent.

Table 3 provides data concerning the death scene investigators reporting of elements specifically related to elder mistreatment. The data shows that the decedent's skin was described by the death scene investigator 69% of the time followed by clothing (16%), nails (14%) and hair (0%). In 4(25%) of the cases the exterior of the home was described. The interior of the home

was described in 13 (76%) of the homes. Similarly, the clutter and the cleanliness of the homes were noted 56% and 62% of the time, respectively. The investigators noted the presence or absence of the utilities and mobility aids in 94% and 67% of the cases respectively.

Several questions pertaining to the decedent's compliance with medical treatment and medications, mental health, cognitive status, alcohol use and financial situation were also assessed. The investigator asked about the decedent's compliance with medical treatment and medications in 10% of the cases. The investigators asked 15% of the time if the decedent refused assistance, 14% of time if the decedent had a dementia diagnosis, and 7% of the time if the decedent had a history of mental illness. The question to determine if each decedent was affiliated with APS was asked in 6% of the cases. Alcohol abuse received a much higher regard by the death scene investigators with an inquiry occurring in 47% of the cases. Inquisitions about the decedent's financial affairs only occurred in 20% of the cases. These data can be reviewed in Table 4.

Discussion

Scene investigation is one of the three areas critical to the determination of cause of death by medical examiners. This study revealed a number of findings about the scene investigation in elder deaths. In every case the investigators, who were largely forensic nurses, noted the appropriate forensic markers as described in Table 3.

What was infrequently or unable to be assessed were activities of daily living, including the basic (e.g. bathing and dressing) and the instrumental (e.g. money and medication management) activities. These two types of activities are a measure of function and when unable to be performed indicate the vulnerability of the decedent. Not all of the investigators may know about activities of daily living nor understand how they may be important data to gather during

scene investigations. In many instances the investigators may not have been able to determine functional ability based on the scene findings, although in the majority of cases they noted if there were any mobility aids (canes, walkers) being used by the decedent. It is appropriate for scene investigators to seek a collateral source to confirm the ability to perform functional activities. This may be difficult in cases of EM where the perpetrator is providing information to the investigators. It may be necessary for investigators to obtain additional information from neighbors or friends who are not as likely to be perpetrators as are family members.

The investigators appeared to do an excellent job of assessing the interior of the home, which is felt to be an important factor in neglect.¹² In the majority of cases they described the interior and commented on clutter, cleanliness and the presence of working utilities. They did not however comment on some of the other markers of neglect such as the hair, nails, skin and clothing of the decedent. They did not note structural problems with the home, another marker of neglect, such as broken floorboards, or crumbling walls.

A number of risk factors for EM were not assessed. Alcohol use has been shown to be a risk factor for EM and only half of the time was this addressed. In most instances the investigators did not ask about medical compliance, refusal of assistance, cognitive impairment, mental illness or financial status or problems. These data suggest that it may be helpful to include training on elder mistreatment risk factors for investigators. It may also be useful to include checklists of EM risk factors in the paperwork used by investigators at death scenes.

The vast majority of the elders were reported to have died as a result of aging of the blood vessels, which is due to hypertensive cardiovascular disease. Since 50-70% of older Americans have hypertension this is a common finding at the time of death. However in five

cases toxicity due to substances (drugs and or alcohol), malnutrition and complications of a hip fracture were noted. Two cases were considered accidental and two were undetermined.

In follow-up, the research team learned that three cases had actually been reported to APS; all three were found dead at home. The suspicion of EM was not noted in any of the paperwork filled out by the investigators. In one case an investigator did contact APS, but that case was not one of the three now known to have been APS cases. Two of the three cases did undergo autopsy and one just an external examination. It is not clear if knowledge that case had ever been reported to APS would be helpful. It does seem that if this information could easily be obtained electronically and APS records subpoenaed just like medical records that this could provide additional data upon which the medical examiners could base their determinations.

In some states, accessing APS records may not be that easy. Although in San Diego, California, this information is shared; APS provides the Medical Examiner's Office with pertinent information regarding each APS case receiving an examination.¹³ In Texas there are problems with sharing these sorts of sensitive data. Moreover, unless easily accessible electronically, obtaining APS records will likely require additional resources, such as staff time.

One limitation of this study is the small sample size. The small sample size was due to the fact that in many cases of elder deaths, the scene is the hospital and scene investigation is not always done in hospitals, nor is it likely to be pertinent. Also, there was no random selection process used to determine which cases the researcher would attend in the company of the death scene investigators.

This study demonstrates that the scene investigation is not necessarily geared to the detection of forensic markers and risk factors for EM. Additional training of investigators in the specifics of EM may be helpful. From a process standpoint, standardized investigation forms that

prompt the investigators to look for signs of EM may be helpful. In addition to information from family members, investigators should look for information from other collateral sources. Lastly, it may prove helpful for the medical examiner to know the APS status of suspicious death cases and a mechanism for easily accessing these records within the boundaries of laws concerning confidentiality.

Table 1: Demographics of Elder Decedents Receiving Death Scene Investigation

Age(Range, Mean)	65-94 (74.5)
Race (n,%)	
White	12 (71)
Non-white	5 (29)
Gender (n,%)	
Male	9 (53)
Female	8 (47)
Living Situation (n,%)	
Alone	7 (41)
W/Family	4 (24)
W/Caregiver	3 (18)
W/Spouse	2 (12)
W/Friends	1 (6)
Cause(s) of Death (n,%)	
Hypertensive Atherosclerotic Cardiovascular Disease	8 (47)
Gunshot Wound to the Head	2 (12)
Polydrug toxicity	1 (6)
Toxic Effects of doxylamine	1 (6)
Malnutrition	1 (6)
Chronic Ethanolism	1 (6)
Complications of blunt trauma and hip fracture	1 (6)
Undetermined	2 (12)
Manner of Death (n,%)	
Natural	10 (59)
Suicide	3 (18)
Accident	2 (12)
Undetermined	2 (12)
Physical Exam (n,%)	9 (53)
Autopsy (n,%)	7 (41)
Missing (n,%)	1 (6)

Table 2: Death Scene Investigator Evaluations of Injuries and ADL and I-ADL Impairments

Body Description: present (noted by investigator)	
Lacerations	3 (3)
Bruises	3 (3)
Fractures	2 (2)
Decubitus Ulcers	2 (2)
Malnutrition	2 (2)
Dehydration	2 (2)
Abrasions	1 (1)
Restraints	0 (0)
Evidence of Past restraints	0 (0)
Burns	0 (0)
Activities of Daily Living (n, %)	
Unable to Assess	10 (58)
Independent	4 (24)
Dependent	3 (18)
Instrumental Activities of Daily Living (n, %)	
Unable to Assess	11 (64)
Independent	4 (24)
Dependent	2 (12)

Table 3: Death Scene Investigator Evaluations of Personal Hygiene and Environmental Factors Associated with EM

	Described by Investigator
Personal Hygiene (n, %)	
Skin	9 (69)
Clothing	2 (16)
Nails	2 (14)
Hair	0 (0)
External Environment (n, %)	
Exterior	4 (25)
Interior Environment (n %)	
Interior	13 (76)
Cleanliness	10 (62)
Clutter	9 (56)
Utilities (n, %)	16 (94)
Mobility Aids (n, %)	10 (67)

All percentages are based on the total number of data points available

Table 4. Questions posed by Death Scene Investigator pertinent to Elder Mistreatment

Question	Inquiry Made (n, %)
Compliance with medical regimen	1(10)
Refused assistance with daily needs	2(15)
Decedent Dementia/Cognitive Impairment	2(14)
Mental Illness	1(7)
Alcohol Abuse	7(47)
Decedent involved with APS	1(6)
Decedents Finances	3(20)

Phase IV: Cross of Adult Protective Service's Database with a Medical Examiner's Database

Overview

The 1998 landmark study by Lachs et al. determined an increased mortality rate for elder mistreatment victims.² However, cause of death in that study was determined by review of death certificates and thus, no clear-cut cause of death was determined as the majority of subjects in the control and experimental groups succumbed to coronary artery disease. In their paper, the authors recognized the limits of death certificate data and thus the need for more comprehensive data related to the death of elder mistreatment victims. The current study is the first to begin to look at medical examiner records with autopsy and external examination results in elder mistreatment cases to determine cause of death.

Methods

Study Design

The names from the Adult Protective Services (APS) database for the years of 1999-2005 were cross-referenced with the Harris County Medical Examiners Office (MEO) database for the same years to determine how many APS clients were examined by the MEO at the time of death. Positive name matches between the two databases were further crosschecked using available demographic information (i.e. date of birth, race, gender) in order to obtain a positive identification for each match. Once all the names were crosschecked the names were divided into two groups consisting of MEO only cases as one group and MEO cases with prior APS affiliation as the other group. Inclusion criteria for the groups were that each person had to be at least 65 years of age at the time of death and had to be examined by the MEO. Once these groups were formed, a random selection process using a random number procedure was

employed to select 33 people from each group for comparison. A MEO file request was then placed at the MEO for each person in each group. Data was extracted from these files by two trained researchers. Furthermore, the data was extracted in accordance with a data extraction form (Figure 1.) designed by a trained geriatrician and expert in the area of elder mistreatment.

Statistical Analyses

All data was analyzed using the Statistical Package for the Social Sciences (SPSS 12.0). The means and standard deviations of the continuous variables were produced using descriptive statistics. Differences in the distribution of the dichotomous variables were assessed using Pearson Chi-square analyses. All other numbers were reported as frequency counts and percentage based values.

Results

Overall, only 1 of the randomly chosen names was unable to be matched adequately and thus was not included in the analyses. Analysis of the demographic data showed the average age for the APS and MEO groups to be 78.1 ± 7.9 and 76.67 ± 8.7 years, respectively. The majority (> 60%) of each group was of Caucasian descent. Gender for the APS group was split equally while the majority of the MEO 19(58%) group was male. Table 1 provides a detailed comparison of the demographic information between the two groups.

Pearson Chi-square analyses did not detect significant differences between the group's distributions in relation to receiving a toxicology screen, evidence of trauma, evidence of fracture, injury or manner of death. However, significant chi-square differences were reported in other areas. Analyses of documented dementia showed that 38% of the APS group versus only .9% of the MEO group has dementia documented in their MEO files ($\chi^2 = 7.39$, $df = 1$, $p = .007$). It was also found that sores and ulcers were significantly more likely to be reported in the

MEO files of the APS group (23%) versus the MEO group (0%) ($\chi^2 = 8.37$, $df = 1$, $p = .004$).

Chi-square analysis also showed that the medical examiner(s) was more likely to perform an autopsy exam rather than a physical exam on APS cases (53%) versus MEO cases (21%) ($\chi^2 = 6.67$, $df = 1$, $p = .010$). A more detailed description of the data found in the medical examiner reports can found in Table 2.

Discussion

Phase IV is the first study of its kind that crosses an APS database with that of a MEO. It revealed surprising results. Over a five-year period, a cross between the APS database and the MEO database yielded over 900 matches, which included inquests. Over 250 of the cross-matched cases received an external examination or a full autopsy. The research team initially estimated that there would be 25-50 matches and never suspected over 200 positive matches. Although the matching was very profitable, unfortunately the MEO database is a paper system (only name and demographic data are in electronic form) and thus, the research team could not examine the entire set of potential data. Therefore, on the basis of feasibility a random sampling strategy was designed and implemented to provide adequate representative data needed for the planned statistical analyses.

The sampling strategy was a sound one as noted in Table 1. There were no statistically significant differences between MEO cases that were also APS cases and MEO cases not reported to APS in terms of age, gender, marital status, living alone, having a relationship with a primary care doctor and dying at home. However, more MEO/APS cases lived alone and died at home. The differences in those two variables, although not significant in this pilot study, might be in the future if larger sample sizes are used.

There were no statistically significant differences in the two groups in those cases with toxicology, or evidence of injury or trauma, including fracture. However, there were more cases in the MEO/APS group with toxicology compared to the MEO cases not reported to APS. This number too, might reach significance if a larger sample size was used. No cases were considered homicides and there were no statistically significant differences in the causes of death.

However, there were several variables that were significant. Far more MEO/APS cases were in persons with dementia, more had skin abnormalities and more underwent autopsy. It has been well established that dementia is a risk factor for elder mistreatment.^{14,15} This finding confirms that fact. Abnormal skin findings such as pressure ulcers were seen in the MEO/APS victims. Pressure ulcers are considered forensic markers of EM.¹⁶ These findings are not surprising and confirm other studies.

One statistically significant finding was that more MEO/APS cases underwent autopsy as opposed to just an external examination. The APS status of a decedent is unknown to the medical examiners in most of the cases that come to their office. Child protective service workers follow their clients for years, and notify the medical examiner if a client dies. APS workers on the other hand, are fewer in number (in Texas and other jurisdictions) and follow cases for months as opposed to years. So an APS worker is not likely to know when his or her client dies and unlike CPS workers are not able to notify the medical examiner if a client expires. The decision to perform an autopsy is made at the time of the case conference, the morning after the death. And in these MEO/APS cases the medical examiners determined that an autopsy was needed.

The low likelihood of medical examiners to perform autopsy in elders has been described.¹⁴ The reasons are that elders are more prone to natural deaths than children and there is a lack of forensic markers to support the decision to perform autopsy. Like younger victims of violence,

which often results in injuries such as orbital fractures, burns etc, there are certain forensic markers in older adults (i.e. skull fractures, malnutrition, pressure ulcers, poor hygiene etc.) that may indicate potential abuse and mistreatment and therefore, may prompt further investigation into the death of the older person.⁶

However, this study demonstrated that the medical examiners chose to perform autopsy in more than half of the APS cases (53%) compared only 21% of the MEO cases not reported to APS. The authors suspect that the medical examiners considered the demented decedents as more vulnerable and so if there was any suspicion of foul play, they went forward with autopsy. They appeared to use the forensic marker of pressure ulcers and other sores to determine which cases required autopsy. The Harris County medical examiners are to be commended for this finding that shows that they actively chose to perform autopsies on cases where at least two of the known risks factors for EM are present.

The limitations of this study are the small sample sizes. However, to adjust for this limitation and reduce potential error in the findings, a random selection process was performed. Despite the small sample size and its limitations, it appears that a large effect size for at least three variables (presence of documented dementia, skin findings and autopsy) is present and adds credibility to the results.

This study provides pilot data for future potential studies. It shows that a retrospective review with a larger sample size and more variables is needed. Prospective studies are also needed to answer questions raised by the study. For example, if the medical examiners know that a decedent had been reported or was currently an APS case would they more likely to perform an autopsy? If in each elder death the investigator was required to determine if the decedent had dementia, would that finding influence the decision to perform autopsy? More studies with

strong methodological design are clearly needed in the forensics of elder mistreatment, to address these and other questions being raised by prosecutors, geriatricians and forensic pathologists.

Table 1. Demographics

	APS(N=32)	MEO(N=33)	Sig.
Age	78.1±7.9	76.7±8.7	---
Ethnicity(n, %)			---
White	20 (62.5)	20 (60.6)	
Non-white	12 (37.5)	13 (39.4)	
Gender(n, %)			---
Male	16 (50)	19 (57.6)	
Female	16 (50)	14 (42.4)	
Married	47%	56%	---
Living Alone	28%	16%	---
Primary MD	86%	86%	---
Home Death	52%	45%	---

--- Indicates no significant difference between the groups based on Chi-square analyses.

Table 2. MEO Reports

	APS(N=32)	MEO(N=33)	Sig.
Toxicology Screen	60%	48%	---
Evidence of Trauma	28%	30%	---
Evidence of Fracture	10%	16%	---
Injury	31%	33%	---
Manner of Death			---
(n, %)			
Suicide	1 (.03)	1 (.03)	
Accident	7 (22)	9 (27)	
Natural	23 (72)	22 (67)	
Indeterminate	1 (.03)	1 (.03)	
Documented* Dementia	38%	.9%	.007
Skin Evaluation* (sores and ulcers)	23%	0%	.004
Autopsy*	53%	21%	.010
Physical Exam*	47%	79%	

---Indicates no significant differences between the groups based on Chi-square analyses.

* Indicates a significant difference between the groups based on Chi-square analyses.

Figure 1. MEO IV Data Extraction Form

ID:

Age:

Gender: F M

Ethnicity: African American American Indian Hispanic/Asian
Pacific Islander White/Other

Zip Code:

Marital Status: Married Widowed Single Divorced Unknown

Living Situation: Alone w/spouse w/daughter w/son w/friend
Personal care home Nursing home other Unknown

Medical Diagnosis:

Medications:

Primary MD: PresentNone Unknown

Site of death: Home Hospital Workplace Nursing home
Relatives home Outdoor Public building other

Circumstance/Location & Position of Body:

Toxicology Screen: Not done negative positive

Body temp at the scene:

Tobacco: Yes No Unknown

Alcohol: Yes No Unknown

Illicit drugs: Yes No Unknown

Evidence of trauma: Yes No
Where on body:

Evidence of Fractures: Yes No Unknown

Where on body:

Condition of Home environment: Clean Dirty Cluttered Pests

No Air conditioning Utilities not working Unknown

Cognitive impairment: Documented dementia Unknown

Severity: Mild Moderate Severe Unknown

Physical impairment: Ambulates independently Ambulates with assistance

Wheelchair bound Bedbound Unknown

Injury: Yes/No

Mechanism of injury: Not applicable Accident Self-inflicted

Caused by other person

Medical Examiner evaluation: Autopsy Physical exam

Body habitus:Normal Thin Cachectic Overweight Obese

Description of fingernail: Clean Dirty Long Unknown

Description of toenail: Clean Dirty Long Unknown

Description of skin: Clean Dirty Sores or ulcers Unknown

Description of hair: Clean Dirty Unknown

Manner of death: Homicide SuicideAccidental Natural

Indeterminate

Cause of Death:

Type of elder mistreatment:Caregiver neglect Self neglect

Physical abusePsychological abuse

Financial exploitation Unknown Not applicable

Perpetrator: Self Daughter Son Spouse grandchild relative

Friend Other Unknown

Services delivered: Provider Meals on wheels Home health agency

Other Unknown

Refused medical service: Yes No Unknown

Health Insurance: Medicaid Medicare other None Unknown

FACTORS THAT IMPACT THE DETERMINATION BY MEDICAL EXAMINERS OF ELDER MISTREATMENT

Conclusion

The four phases of this project shed light on multiple issues concerning the forensics of elder mistreatment (EM). Phase I results showed that medical examiners infrequently determine elder mistreatment as a cause of death in older decedents. Chronic diseases and features of old age confound the picture and significantly complicate the determination of death as a result of EM. Medical records and other information, including scene investigation reports, are often inadequate to providing information, which may aid medical examiners in their cause of death determinations.

Phase II results showed that while the medical examiners are expert at performing autopsies, interpreting toxicology and determining the cause and manner of death, they are not versed (nor should they be expected to be) in the standard of care of older persons. Geriatricians, who are unable to perform autopsies and are not skilled in cause and manner of death determination, are however experts in the care of living older persons. It seems more appropriate for geriatricians to review the records of decedents when they were living and to render opinions about the standard of care as well as the presence or absence of EM. Currently, there is little information concerning the effects of collaboration between medical examiners and geriatricians in regards to the identification of death due to elder mistreatment. The goals of these studies were to increase medical examiners sensitivity to and identification of death due to elder mistreatment. We feel that increased sensitivity was achieved, but the increase in identification was only noted anecdotally. Further studies, such as action research, emphasizing the measure of

change in response to procedural differences are needed to further understand the effects of this interdisciplinary approach.

Phase III showed that the scene investigation is not necessarily geared to the detection of forensic markers and risk factors for EM and that the training of investigators in the specifics of EM may be helpful. Studies could be conducted using standardized investigation forms that prompt the investigators to look for signs of EM. In addition to information from family members, investigators should look for information from other collateral sources. The means for the medical examiner to have access to APS records may improve the autopsy rate in cases of suspicious elder death.

Phase IV showed that cases where dementia was documented or there were skin findings such as pressure ulcers were more likely to be autopsies and were more likely to have been an APS case prior to the death of the decedent. These data do not suggest that more autopsies are the answer to the problem of the lack of the determination of EM as a cause of death. Instead, autopsies performed in targeted cases where EM was likely may yield more useful data to assist medical examiners in their determinations.

In sum these four studies show that determination of death due to elder mistreatment is very difficult. There are not the data on forensic markers needed to support the medical examiners assessments, they have little training in geriatric medicine and it is difficult to evaluate the differences in old age and disease versus EM. The expertise of geriatricians or geriatric nurses practitioners is likely needed for interpretation of the medical records. Without this evaluation of the events leading up to death, the medical examiner is forced to evaluate what happened in the hours just preceding death. This is likely to be acute cardiac and/or pulmonary failure and not the neglect or abuse that put the vulnerable elder in a weakened and vulnerable

state. These studies provide support for the needed collaboration between geriatricians and medical examiners to increase the identification of death due to elder mistreatment. To cultivate more collaboration ME's offices could: 1) have geriatricians in attendance at team meetings, 2) solicit consultation from geriatricians on selected cases and/or 3) employ trained geriatric forensic specialists. Lastly, larger studies are needed to evaluate the forensic markers in MEO cases reported to APS cases versus MEO cases that were never reported to APS to determine the risk factors for death due to elder mistreatment.

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APPENDIX A: Death Scene Investigation Forms

I. Data points collected by Medical Examiner's Office investigator

Decedent name

DOB

Age

Race

Sex

Home address

Date/time of death

Found by

Last known alive date/time

Last seen by

Place of death (home, hospital, scene)

Hospital:

Brought from: (residence, scene, hospital)

MR #

Medical records obtained:

Location/position/surroundings of body at scene

Lividity (yes, no)

Consistent with body position (yes, no)

Rigor mortis (yes, no), description

Decomposed (early, moderate, advanced)

Axillary temp

Brought to hospital by

Pronounced dead by

Chief complaint/circumstances

Medical history

Prescription medications (attach medication sheet)

Personal physician

Social history

Tobacco (no, yes, unknown, light, moderate, heavy)

Alcohol (no, yes, unknown, light, moderate, heavy)

Drugs (no, yes, type)

Clothing

Personal effects

Legal next of kin

Identification

I. Death Scene Investigations

Name of Investigator

Qualifications of investigator (e.g. investigator/forensic nurse investigator)

Information provided to investigator prior to dispatch to scene (brief summary)

Law enforcement at scene (HPD/CSU/HCSO)

Brief summary of further information provided by law enforcement to investigator at scene:

Police report number

Decedent

	Body region viewed/examined	Injury noted	Type of injury
Head			
Face			
Neck			
Chest			
Abdomen			
Back			
R arm			
L arm			
Sacrum			
Anus			
Genitalia			
R leg			
L leg			
R foot/heel			
L foot/heel			

Investigator notes **abrasions**
 Yes if yes – locations clearly present but not noted

Investigator notes **lacerations**
 Yes if yes – locations clearly present but not noted

Investigator notes **bruises**
 Yes if yes – locations clearly present but not noted

Investigator notes **fractures**
 Yes if yes – locations clearly present but not noted

Investigator notes **restraints**
 Yes if yes – locations clearly present but not noted

Investigator notes **evidence of past use of restraints**
 Yes if yes – locations clearly present but not noted

Investigator notes **decubitus ulcer (s)**
 Yes if yes – locations clearly present but not noted

Investigator notes evidence of **malnutrition**
 Yes if yes – signs clearly present but not noted

Investigator notes evidence of **dehydration**
 Yes if yes – signs clearly present but not noted

Investigator notes **burns**
 Yes if yes – locations clearly present but not noted

Investigator notes **other injuries** not prev. specified
 Yes if yes – locations clearly present but not noted

General hygiene of decedent

Hair

Description of hair by investigator

Exact description not described

Researcher’s rating of decedent’s hair

1 (clean/combed) 2 3 4 5 (matted/very dirty) no hair

Unable to assess/reason:

Nails

Description of nails by investigator

Exact description not described

Researcher's rating of nails

1 (clean/trimmed) 2 3 4 5 (long/untrimmed/dirty)

Unable to assess/reason:

Skin

Description of skin by investigator

Exact description not described

General body regions visible to researcher during investigation:

Researcher's rating of skin

1 (normal) 2 3 4 5 (multiple/severe ulcers/injuries)

Unable to assess/reason:

Clothing

Investigator's description of state of clothing

Exact description not described

Researcher's rating of clothing

1(clean/neat) 2 3 4 5(very soiled)

Unable to assess/reason:

Environment

Apartment Condominium House Care facility

Investigator's description of state of dwelling's **exterior condition**

Exact description not described

Researcher's rating of **exterior condition**

1(neat/well-kept) 2 3 4 5 (dilapidated/poorly maintained)

Investigator's description of state of **condition of structure**

Exact description not described

Researcher's rating of **condition of structure**

1 (no app. problems) 2 3 4 5 (severe structural damage/holes in roof)

Investigator's description of dwelling's **interior condition**

Sleeping area

Living area

Kitchen

Bathroom

Researcher's description of state of **interior condition**

Sleeping area

Living area

Kitchen

Bathroom

Investigator's description of degree of **clutter**

Exact description not described

Researcher's rating of **clutter**

1(neat/orderly) 2 3 4 5(very cluttered)

Investigator's description of degree of **cleanliness**

Exact description not described

Researcher's rating of **cleanliness**

1 (clean) 2 3 4 5(very dirty/trash strewn about)

Utilities available in decedent's home (water, electricity, AC, telephone)

If utility unavailable, investigator notes absence (water, electricity, AC, telephone)

Tobacco/alcohol/drugs

Tobacco products readily available (yes, no)

Types of tobacco present

Alcohol readily available (yes, no)

Types of alcohol present (beer, wine, liquor)

Count of alcohol containers (x empty, x full)

Drug paraphernalia present (yes – specify, no)

Mobility aids

Investigator notes presence of **mobility aids** (e.g., wheelchair, walker, crutches) (yes, no)

Mobility aids present (wheelchair, motorized scooter, walker, crutches)

Investigator notes if conditions incompatible with decedent’s impaired mobility (yes, no)

(researcher lists brief description of why mobility would be limited, e.g. wheelchair-bound but furniture/belongings/clutter/trash would prevent movement)

Medication

Investigator collects all **medication** bottles readily available at scene (yes, no)

Medical-related papers/information readily available at scene (yes, no)

Investigator collects/photographs medical-related papers/information at scene (yes, no)

Nutrition

Investigator looks for nutritional products (refrigerator, freezer, pantry)

Overall quantity of **food** on premises (none, minimal, fair, good)

Overall quality of food on premises (poor, fair, good)

Caregiver/family

Classification of decedent’s living situation/social relationships

1.Decedent living alone, independently, no one to provide collateral information at scene

2.Decedent living with spouse only

3.Decedent living with family

Note relationships to decedent (spouse, child, other)

4.Decedent living with friend

Note duration of /characterize relationship

5.Decedent living alone, part-time non-related caregiver

Investigator assesses specific role of caregiver (yes, no)

6.Decedent living alone, part-time family caregiver

Investigator assesses specific role of caregiver (yes, no)

If not independent, what level of care received (home health, other, 24-hour care)

Bedbound (yes, no, unable to assess)

Dependent for ADLs? (feeding, dressing, toileting, bathing) (yes, no, unable to assess)

Dependent for IADLs? (cooking, using phone) (yes, no, unable to assess)

Investigator asks names and relationships to decedent of those present at scene
(complete, incomplete, does not ask)

List names and relationships

List of person(s) responsible for care of decedent

Investigator asks what type of care provided by each caregiver (yes, no)

Type of care provided (list)

Investigator asks about decedent's past medical history (yes,no)

Family/caregiver able to provide coherent PMH (complete, incomplete, unable to provide)

PMH provided to investigator by caregiver/family:

Family/caregiver able to provide names of general classes of **meds** (e.g. BP, heart meds)

Yes – specify

No

Family/caregiver able to provide name of **personal physician**

Yes

No

Name, contact info

N/A – decedent with no personal physician

Decedent recently **hospitalized**

Yes

No

Location, admission date, discharge date, admitting diagnosis

Investigator asks if decedent **non-compliant** with medical tx/meds (yes, no)

Family/caregiver reports decedent **non-compliant** with medical tx/meds (yes, no)

Decedent noncompliant (yes, no)

Investigator asks if decedent **refused assistance** with daily needs (yes, no)

Family/caregiver reports decedent **refused assistance** with daily needs (yes, no)

Decedent refused assistance (yes, no)

Investigator asks if **decendent** had **dementia/other cognitive impairment**

Yes – specify No

Family/caregiver reports **decendent** with **dementia/other cognitive impairment**

Yes – specify No

Investigator asks if **caregiver** has **dementia/cognitive impairment**

Yes – specify No

Family/caregiver reports **caregiver** with **dementia/cognitive impairment**

Yes – specify No

Investigator asks if decedent had **hearing impediment/speech difficulty**

Yes – specify No

Family/caregiver reports **hearing impediment/speech difficulty**

Yes – specify No

Investigator asks if **decendent** had history of **mental illness**

Yes – specify No

Family/caregiver reports **decendent** had history of **mental illness**

Yes – specify No

Investigator asks if **caregiver** had history of **mental illness**

Yes – specify No

Family/caregiver reports **caregiver** had history of **mental illness**

Yes – specify No

Investigator asks if **decendent** had history of **alcohol abuse**

Yes – specify No

Family/caregiver reports **decendent** had history of **alcohol abuse**

Yes – specify No

Investigator asks if **caregiver** had history of **alcohol abuse**

Yes – specify No

Family/caregiver reports **caregiver** had history of **alcohol abuse**

Yes – specify No

Investigator asks if **caregiver** had history of **drug abuse**

Yes – specify No

Family/caregiver reports **caregiver** had history of **drug abuse**
Yes – specify No

Investigator asks if APS ever involved with decedent
Yes – specify No

Family/caregiver reports **APS** involved
Yes - specify No

Caregiver/family **story matches** findings at scene
Yes No

If **inconsistencies**, investigator questions caregiver/family further
Yes No

Investigator asks/obtains information about decedent’s finances (yes, no)

Family reports information about decedent’s finances (yes, no)

Decedent reported to be **independent in financial affairs** (yes, no, unable to assess)

Decedent had **payee for SSI/pension** (yes, no, unable to assess)

Caregiver reports past **concern for financial exploitation**
Yes – specify No

Family reports past **concern for financial exploitation**
Yes – specify No

II.Morning conference

Medical records available to investigator before conference (yes, no)

Source of medical records
EMS
Hospital
Personal physician

Based records, **delay between injury/illness and seeking medical attention** (yes, no)

Pertinent findings of scene investigation conveyed in presentation (complete, incomplete)

Pertinent findings of scene investigation conveyed in written report/addenda prior to autopsy (complete, incomplete)

Investigator contacted **APS**/aware of APS involvement (yes, no)

If APS determined to be involved, specific information available before conference (e.g. particulars about allegations – physical or emotional abuse, neglect, self-neglect)

Yes – specify No

Case suspicious for abuse (yes, no)

If case suspicious for mistreatment, point specifically brought up to ME's in conference (yes, no)

If case suspicious for mistreatment, point specifically made in investigator's written report (yes, no)

If case suspicious for mistreatment, response of ME's during conference (actively voice concern for mistreatment, request more history, request more records)

Yes – specify No

Assignment of case (external, autopsy)

Daily workload - (Attach morning conference form)

of overall cases

breakdown of cases

 # of homicides

 # of suicides

 # of naturals

 # of accidents

 # of undetermined

 # of cases assigned to each ME

III.External exam/autopsy

Name of ME

Type of exam	External	External converted to autopsy	Autopsy
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A.Decedent - External

	Body region viewed/examined	Injury noted	Type of injury
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Head

Face

Neck

Chest

Abdomen

Back

R arm

L arm

Sacrum

Anus

Genitalia

R leg

L leg

R foot/heel

L foot/heel

ME notes **abrasions**

No Yes if yes – locations clearly present but not noted

ME notes **lacerations**

No Yes if yes – locations clearly present but not noted

ME notes **bruises**

No Yes if yes – locations clearly present but not noted

ME notes **fractures**

No Yes if yes – locations clearly present but not noted

ME notes **restraints**

No Yes if yes – locations clearly present but not noted

ME notes **evidence of past use of restraints**

No Yes if yes – locations clearly present but not noted

ME notes **decubitus ulcer (s)**

No Yes if yes – locations clearly present but not noted

ME notes evidence of **malnutrition**

No Yes if yes – signs clearly present but not noted

ME notes evidence of **dehydration**

No Yes if yes – signs clearly present but not noted

ME notes **burns**

No Yes if yes – locations clearly present but not noted

ME notes **other injuries** not prev. specified

No Yes if yes – locations clearly present but not noted

Decedent examined specifically for signs of sexual abuse (yes, no)

Decedent's oral cavity/dentition examined (yes, no)

Summary of pathological findings in ME's final report

Cause of death

Manner of death

If injuries highly suggestive of mistreatment, attributed to disease process (yes, no)

If injuries highly suggestive of mistreatment, attributed to "natural causes" (yes, no)

Findings at autopsy consistent with caregiver/family's story as reported by investigator (yes, no)

Samples sent for **toxicology** (list, specify why)

Samples sent for **histology** (list, specify why)

Radiology films from hospital available to ME at time of autopsy (yes, no)

Radiology reports from hospital available to ME at time of autopsy (yes, no)

Further X-rays, lab studies requested (yes, if yes – list, no)

More detailed than normal autopsy performed (e.g. sinuses opened, extremities dissected) Yes – specify
No

Discrepancies between information presented at conference/in investigator's written report and ME's final external exam/autopsy report concerning mistreatment (yes - specify, no)

ME attributes injuries to possible mistreatment in final report (yes, no)

ME personally contacts/requests investigator contact law enforcement regarding suspicion of mistreatment (yes, no)

Determination of cause of death made immediately following autopsy (yes, no)

If determination not made immediately following autopsy, reason for left pending (specify)

Amount of time case pending (specify)

Information obtained to close case (specify)

Upon review of medical records during autopsy, ME states that available medical records inadequate

Yes – specify
No

ME requests nurse investigator obtain further medical records after autopsy (yes, no)

ME requests nurse investigator obtain other information after autopsy
Yes – specify No