

The Development of Law Enforcement Investigative
Guidelines for Unexplained Infant Deaths

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ABSTRACT

Without information from a complete death scene investigation involving sudden unexplained infant deaths, it is difficult to determine cause of death. Several studies provide evidence to support the hypothesis that SIDS and other SUID are more accurately diagnosed when information from a death scene investigation is used to make the diagnosis (Bass and Hass). Standardized protocols exist for coroners and child abuse experts; few if any are required for law enforcement death scene investigators.

An analysis of twenty two infant deaths under one year of age was conducted within Trumbull County. An additional five cases from the text “The Death of Innocents” were reviewed. The data collection instrument was a data sheet that contained twenty three SUID/SIDS related factors, such as, demographics of victim and caretaker, manner and cause of death, infant health, and death scene related factors. Resulting data was analyzed than tested for statistical correlation based on the use of a protocol in relation to the ruling of SIDS or none SIDS.

An extensive literature review is offered. It reviews all of the factors used in the data collection instrument. Past and current national and international research and theory on SUID and SIDS is cited.

Overall it appears that in the absence of a protocol being used the ruling was more likely SIDS or asphyxia than other rulings of cause of death. Other factors that were correlated with cause of death are age of infant at time of death, prenatal development, and health of infant prior to death.

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CHAPTER I

INTRODUCTION

In the United States, homicide is the fifteenth leading cause of death during the first year of life. The risk of homicide is greater in infancy than any other year of childhood before age seventeen. Homicide accounts for more than one in five injury-related deaths among infants, less than one year of age. The infant homicide rate increased from 4.3 per 100,000 in 1970 to 9.2 per 100,000 in 2000, before declining to 8.3 per 100,000 in 2007 (Melonie). In a 2002 report the Centers for Disease Control (CDC) revealed that of all the infant homicides committed during the first week of life, 82.6% are committed on the first day of birth, 9.2 % on the second day, and 8.2 during the remainder of the week. According to the CDC, about 9.1% of all infant homicides occurred during the first week of life (“Variation in Homicide”).

In the 1980s, researchers started to take a close look at sudden unexplained infant deaths (SUID) and Sudden Infant Death Syndrome (SIDS), in hopes of identifying risk factors to educate parents. Some identified risk factors; prone sleeping for example, has contributed toward reducing SIDS. However, lack of specific defining features for SIDS has meant that deaths due to unnatural causes, such as suffocation, where there has not been a postmortem and death scene investigation finding to indicate a cause of death, have been misdiagnosed as SIDS (Stanton). Investigating SUID in the United States serves as one of the many challenges facing law enforcement. Research studies of infant death data drawn nationally from multiple agency records, such as police or social service records, indicate that the actual rate of infant deaths attributable to abuse is more than twice as high as the official rates reported on death certificates (Overpeck).

It is a fact that federal, state, and local investigators often receive little instruction when it comes to SUIDs and do not fully understand their role in such investigations. Many officers do not know the difference between SUID and SIDS. Sudden, unexplained infant deaths (SUIDs) are those for which no cause of death was obvious when the infant died. Sudden infant death syndrome (SIDS) (also known as crib death) is the most frequently determined cause of SUIDs. SIDS is the sudden death of an infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history. SIDS should not be diagnosed if these criteria are not met (Centers For Disease Control, "Guidelines for Death Scene"). Many researchers who study SIDS consider "SIDS a diagnosis of exclusion" (American SIDS Institute). As with any death scene, SUID investigations are greatly affected by the passage of time. To perform their work efficiently, investigators must know what to look for and how to document the findings. In short, any officer that comes into contact with a SUID scene should not only be highly trained in their specific scope of duties, but should have guidance such as a prescribed protocol or checklist to guide their actions. Differentiating between an unexpected death due to SIDS and one due to homicide relies on the initial death scene investigation and is recognized as essential for proper diagnosis.

The Problem

Approximately fifty years ago, the medical community began a search to understand and prevent sudden infant death syndrome (SIDS). Early researchers believed that the majority of sudden unexplained infant deaths were caused by SIDS and, cases were genetically linked. These heredity theories of SIDS caused medical and law

enforcement professionals to overlook many cases that were the result of homicide (American Academy of Pediatrics “Distinguishing Sudden” 437). A review of the literature shows that few protocols existed during the early development of the SIDS theory.

During the early eighties, researchers in Great Britain became aware of parents attempting to suffocate their infants so it would appear to be a death that resulted from SIDS. After the findings in Great Britain, medical and law enforcement professionals in the U.S. took another look at SIDS cases and almost immediately became aware that some of these cases were the result of child abuse.

According to the American Academy of Pediatrics (AAP), there has been a steady increase of reported child abuse since the start of this research. Well validated reports of child abuse and infanticide perpetrated by suffocation and masqueraded as apparent life threatening events (ALTE) and/or SIDS have appeared in medical literature and media sources (“Distinguishing” 438).

The Centers for Disease Control reported that three thousand to seven thousand cases of SIDS occurred in 1983, while in 2009, that rate plummeted to 2,500 cases. The National Center of Health Statistics reported that cases of SIDS in the U.S. have dropped 38% since 1983. The CDC cautions that SIDS related statistics may not be accurate due to varied reporting methods by coroners and law enforcement agencies.

Therefore any national comparability of death scene data is limited (Mendoza).

The difference between SIDS and fatal child abuse can be a critical diagnostic decision for law enforcement personnel. The numerous and independent governmental jurisdictions in the United States make it problematic in diagnosing SIDS for law

enforcement and medical professionals. A detailed death scene investigation is an important and increasingly recognized step in determining whether the death is of natural causes or child abuse (American Academy of Pediatrics, “Distinguishing Sudden” 439). The difficulty in determining SIDS as the cause of death is compounded by the differences in methods used by the professionals involved in performing death scene investigations. The problem addressed by this research is the lack of required standardized guidelines, protocols, and training for law enforcement personnel investigating suspected SUID related incidents in the state of Ohio.

A good illustration for developing and making investigative guidelines or protocols mandatory can be seen in a study published in the British Medical Journal (BMJ). A study was conducted to evaluate a multi-agency protocol for the investigation of unexpected child deaths in Sussex England. The SUID protocol according to the BMJ was not mandated, but suggested for SUID investigations. The protocol was implemented in 1999 and the findings came out in 2004. A key finding of the BMJ report was that implementation of the protocol that had been developed and agreed upon by the police, social services, and coroners was not being implemented in a consistent manner and varied throughout the county. The study revealed gaps and inconsistencies in post-mortem investigations, where post-mortems were delayed by more than three days or in some cases not done at all. This delay according to the article meant that evidence might have been lost (Livesey 227-228).

Need for Local Study

A review of the literature suggests that studies involving infant deaths have given investigators a closer insight into circumstances of these types of deaths. It appears that

even with these closer insights, no standard protocols or operational policies for routine child death investigations have been required, especially for law enforcement agencies. Few epidemiological studies have used thorough death scene investigations in a systematic way, including a standardized, objective observation of the scene. These studies gave close insights into the circumstances of infant death, but their complex protocols are mostly not feasible for routine use by law enforcement investigators (Schlaud 28).

Standardized protocols for post-mortem examinations for SIDS are now in use by many coroners, medical examiners, and child abuse experts. Specific protocols are still missing for the initial death investigation that is performed by on-scene investigators. Developing routine death investigation techniques through standard protocols would not only be important in determining natural death or homicide, but also to generating standardized data for SIDS research. The data could be used by researchers in developing hypotheses that might in turn lead to better understanding of some underlying measures of preventing additional SIDS deaths. Data collated during the initial death investigation could be used by social agencies in identifying additional children in the household at risk for child abuse which in some cases might lead to homicide (American Academy Of Pediatrics, “Distguishing Sudden” 439).

Definitions

The key terms or phrases used in this thesis are defined as the following:

Apnea: Apnea of infancy is the cessation of breathing for longer than 15-20 seconds or for any duration if it is accompanied by color changes (American Academy of Pediatrics, “Distinguishing Sudden Infant”).

Apparent Life Threatening Event (ALTE): A non-specific diagnosis of an acute, unexpected change in an infant's breathing behavior that is frightening to the caretaker and that includes some combination of the following features: apnea, color change, change in muscle tone, and choking or gagging. In some cases, the observer fears that the infant has died. Recovery occurs only after stimulation or resuscitation (American SIDS Institute).

Munchausen Syndrome by Proxy (MSP): A rare form of child abuse where the victim, usually a child, is made ill by a parent or caretaker, who falsifies a victim's medical condition to meet self-serving psychological needs (ECKER).

Policy: A definite course or method of action selected from among alternatives; to guide and determine present and future decisions (Merriam Webster, "Dictionary Online").

Procedure: Specific methods employed to express policies in action in day to day operation of an organization (Merriam Webster, "Dictionary Online").

Protocol: Prescribing to strict adherence to correct precedence (Merriam Webster, Dictionary Online").

Sudden Infant Death Syndrome (SIDS): " sudden death of an infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history." (American Academy of Pediatrics, "Distinguishing sudden").

Sudden Unexplained Infant Death (SUID): Sudden, unexplained infant death that occur suddenly and unexpectedly, have no obvious manner and cause of death prior to investigation. Excludes deaths with and obvious cause. (Centers for Disease Control, "Sudden Unexpected").

Overview of the Thesis

As a method for identification of the problem concerning the lack of a standardized protocol or guideline for the investigation of SUID and SIDS, this study will set out to determine what, if any, protocols or guidelines exist for law enforcement as first responders and death scene investigators. Identifying the problem is necessary because it appears that a proper diagnosis of SIDS is dependent on the initial death scene investigation that is conducted by law enforcement officers. It is also necessary so that a case of child abuse or homicide is not misidentified. The implications of such an error can have grave consequences on existing and future siblings of the victim if, in fact, it is mislabeled as SIDS. The literature and court proceedings are full of examples of parents who have committed multiple infanticides during the course of many years.

A literature review is presented in the next chapter. It reviews historical aspects of the early diagnosis of SIDS by the medical community, specifically how it influenced law enforcement investigative policies or the lack of such policies. This chapter also reviews publications such as medical journals, books, and governmental documents related to SIDS investigations. Additionally, a critical analysis will be conducted of major ideas, theories, or concepts. SIDS cases that were later shown to be homicide will be presented in relation to past and present theories of SIDS. A SIDS case that this author personally investigated will be discussed. It is expected that the SIDS case reviews will develop patterns of commonality and in turn suggest investigative techniques. Finally it is expected that this review will show how law enforcement and medical theories of SIDS have evolved and influenced each other in developing present day investigative strategies to assist law enforcement and others involved in child death investigations.

Chapter three discusses methodology and design. The data collection instrument, study sample, and data collection procedures are reviewed.

Chapter Four offers an analysis of the findings. First, a descriptive analysis of the case samples is discussed. Second, findings for each major category of the collected data are presented. Finally, comparisons based on age, gender, race, manner and cause of death, parents, death scene, and other related findings are summarized.

In conclusion, Chapter Five offers a discussion of the limitations and implications of the findings as well as recommendations for developing death scene investigation guidelines.

CHAPTER II

LITERATURE REVIEW

Sudden Infant Death Syndrome, also called “crib” or “cot death”, is defined as the sudden death of an infant younger than one year of age, which remains unexplained after a thorough investigation (McEntire). SIDS is just one of several causes of SUID in infancy, but it is the most frequently reported. SIDS is considered the leading cause of death in infants between one month and one year of age in the United States where approximately 2500 children per year die as a result and accounts for 35% of post neonatal deaths. Research shows infants that are reported to have died of SIDS are between two and four months and 90% are less than 6 months old. Most infants die during sleep, often between midnight and 6:00 AM, and have no signs that they suffered any type of trauma (Bass and Hass).

According to the American Academy of Pediatrics (AAP), an infant’s death caused by manual suffocation is very difficult to differentiate from a death due to natural causes. Therefore, the AAP cautions that before a child is said to have died of SIDS, all other possible causes of death must be investigated. The diagnosis of SIDS is exclusionary and requires a post-mortem examination, death scene investigation, and a complete review of case records that fail to reveal another cause of death (“Distinguishing Sudden” 438). Two U.S. studies provide evidence that cause-of-death reporting and classifying of SUID may be unreliable. These studies found that the decline in the SIDS rate since 1999 was offset by an increase in mortality rates for accidental suffocation and strangulation in sleeping areas and for unknown reasons/unspecified causes (Melonie) . Some deaths that were once reported as SIDs are now reported as

accidental suffocation or unknown causes. This finding suggests that changes in reporting of cause of death might account for part of the recent decrease in rates of SIDS.

In 1992, the U.S. Senate and the U.S. House of Representatives became aware of the SIDS reporting problem and recommended that the U.S. Department of Health and Human Services Interagency panel on Sudden Infant Death Syndrome establish a standard scene investigation protocol for SUIDs. In 1993, several members of the Panel convened a workshop to gather information and ideas to use in such a protocol. The Panel published “Guidelines for Death Scene Investigation of Sudden, Unexplained Infant Deaths: Recommendations of the Interagency Panel on Infant Death Syndrome”. The panel was able to come up with a protocol to standardize the investigation of SUID scenes. It was hoped that the protocol would assist researchers in accurately determining the cause and risk factors of SIDS. Although SIDS research and prevention was a large portion of the protocol, the Panel believed it could also be used by medical examiners, coroners, death investigators, and police.

The CDC reports that the present autopsy rate for SUIDs is 90%. Although the autopsy rate for SUIDs has increased immensely, protocols still vary by local death investigation policies and procedures. The biggest problem caused by multiple jurisdictions is the investigation of the death scene by police. According to the CDC the proportion of deaths ruled to be caused by SIDS that include a full death scene examination is unknown. It would appear that the rate would be low (“guidelines for Death Scene Investigation of Sudden”).

The review of the literature suggests that many states have laws related to SIDS. The laws vary significantly, both in scope and subject. Although the definition of SIDS is

common, many states' definitions vary in terms of the age at which a child may be considered to have died from SIDS. Most commonly, states have laws that provide guidance for coroners or medical examiners and set protocol for autopsies of SIDS victims. Many states also require that an expert on SIDS participate in child fatality review committees, Ohio being one of these states. In addition, several states have SIDS advisory councils, education programs or counseling programs. Still other states require data collection or research on SIDS. At least eleven states require special training for child care personnel, firefighters, emergency medical technicians, and law enforcement officials (National Conference of State Legislatures).

Ohio, for example, has set specific guidelines under Section 313.121 of the Ohio Revised Code. This section deals specifically with the county coroner and the way he or she must proceed with autopsies when a child younger than two years of age, who apparently is in good health, dies suddenly. Ohio Revised Administrative Code Section 3701.67 also directs counties in establishing a child review board. These mandated boards review deaths of children up to eighteen years of age. The child review board, according to the statute, is required to establish programs to decrease the incidence of preventable child deaths. Under section 3701.67.05, the statute further directs how training guidelines shall be implemented for board members. The training addresses the collection of data and forwarding the data once a year to the Ohio Department of Health, which has legislative authority over the boards.

Ohio Revised Code 313.121 and Ohio Administrative Code 3701-67-05 do not mandate procedures or training for police or death investigators. To aid local child review boards in performing their ultimate goal of prevention, law enforcement investigators

must conduct thorough investigations of all child deaths (Kelley). The only way to be certain this is done is to establish specific guidelines for training and investigative procedures, which has not been done on any consistent basis.

Between 2001 and 2002 the Committee on Child Abuse and Neglect of the AAP reported that as the occurrence of cases of SUIDs has decreased, the proportion of unexplained infant deaths attributable to fatal child abuse may be increasing. The committee estimates that the incidence of infanticide among cases designated as SIDS range from less than 1% to 5% (American Academy of Pediatrics, “Distinguishing Sudden” 438). A descriptive study of infant mortality data between 1984 and 2004 found that suffocation and strangulation due to sleep area factors increased from 2.8 to 12.5 deaths per 100000 live births, with the most dramatic increase occurring between 1996 and 2004, with a fourteen per cent annual increase (Mendoza). In contrast total SUID rates remained unchanged between 1984 and 2004, with SIDS deaths declining. The study reports that the notable decline in SIDS during the 1990s was credited to efforts promoting prone sleeping for infants, but according to Mendoza the safe sleep prevention efforts may have little effect in reducing SUID deaths. Instead the author contends that the relatively stagnant total SUID rate together with the decline in SIDS rates are being offset by increases in the way the deaths are now being investigated and classified. Key risk factors for investigators to consider in SUID investigations are those surrounding the child’s birth and other maternal factors.

The Committee on Child Abuse and Neglect further noted that parents of infants with recurrent apparent life threatening events (ALTE) have been observed (by means of covert surveillance) trying to suffocate and harm their infants (American Academy of

Pediatrics, “Distinguishing Sudden” 438). Apparent life-threatening event is used to describe an acute, unexpected change in an infant's breathing behavior that was frightening to the infant's caretaker and included some combination of the following features:

1. Apnea — usually no effort to breathe or sometimes attempts to breathe with the following:
2. Color change — usually blue-tinged or pale skin, but occasionally reddened;
3. Marked change in muscle tone; and
4. Choking or gagging;

In the past, children who experienced ALTE were believed to be at risk for SIDS. However, the vast majority of infants who die of SIDS do not experience ALTE prior to death. Studies over the past two decades have failed to find any evidence that children who experience ALTE are at an increased risk for SIDS (American Academy Of Pediatrics, “Apnea Sudden Infant”).

In North Staffordshire Hospital, England, covert video surveillance was used to assess child abuse risk in thirty- nine children referred for evaluation of recurrent ALTE. Abuse was revealed in thirty-three out of thirty-nine cases, with video documentation of intentional suffocation observed in thirty cases. In addition twelve out of forty one siblings of the thirty- nine infants in the studies had previously died suddenly and unexpectedly. Although eleven of these deaths had been classified as SIDS, four parents later admitted to suffocating eight of these siblings (Patricians). Other cases previously thought to be multiple SIDS deaths within a family have been revealed to be cases of multiple homicides by suffocation (Southhall).

The Death of Innocents, a book that investigates several cases of multiple SIDS deaths in single families appears to reinforce the concept that multiple occurrences of SIDS in families might actually be multiple homicides. *The Death of Innocents* further reveals how Dr. Alfred Steinschneider, a renowned pediatrician during the mid to late-sixties, helped to develop the theory of SIDS. Dr. Steinshneider's work on multiple SIDS deaths and how they related to heredity and the nervous system caused the medical community and law enforcement to misdiagnose many infant deaths (Firstman). During the early eighties, Dr. Steinshneider's research was debunked as being manipulated for personal gain. These new insights caused the medical and law enforcement communities to re-examine earlier theories of SIDS. In turn numerous infant death rulings were reclassified from SIDS to homicide.

In 2001 this author investigated multiple SIDS deaths in a single family. The deaths of two infant males and two females occurred between 1968 and 1972. The infants were between the ages of two to twelve weeks. A review of the medical history of the infants revealed that they all experienced ALTE prior to their deaths. A fifth infant, a female, survived five ALTEs. The deaths occurred at the height of Dr. Steinschneider's SIDS theory. The death certificates which were obtained from the Trumbull County Board of Health listed the cause of death as SIDS for all four infants. During the investigation, medical records were found that noted all of the infants died under the same circumstances. It appears that because of the accepted theory of SIDS at the time of the deaths, investigators failed to see a pattern of a mother who was systematically and deliberately killing her babies. Like other cases of infanticide that occurred across the United States, officials in Trumbull County failed to conduct a proper death scene

investigation and forensic medical examination. Both the medical community and governmental agencies failed to intervene. The lack of intervention was not done because of incompetence or indifference. The involved agencies were acting on the bases of theories and knowledge that were thought to be sound at the time. This author believes that if a protocol had been in place for a proper and detailed initial death investigation, law enforcement, child abuse experts, and the county coroner's office might not have missed what now seems obvious.

To date the review of the literature suggests that there is no standard protocol required by the federal government or the state of Ohio in the way SUID deaths are investigated by law enforcement personnel.

Early Research and Theories

Medical research and theories often guide practices in the field of law enforcement. For this reason, it is imperative that law enforcement investigators, prosecutors, and coroners are not only familiar with, but question any new research or theories that have implications in the performance of their duties. To date, researchers still do not know what causes SIDS, even though there have been many theories over the years. It is important to understand some of these major theories and how they have impacted medicine and law enforcement.

In the 1920s when researchers first started considering possible causes for SIDS and SUIDs, the logical approach was to autopsy infants who died of SIDS and compare them to those who died of non-SIDS related deaths. Researchers found that many of the SIDS infants seemed to have enlarged thymus glands, especially in comparison to non-SIDS infants. The medical community developed a theory that the enlarged thymus might

block the trachea of the infants during sleep. The treatment devised for the thymus problem by leading pediatrics was to apply large doses of radiation to the thymus in hopes of shrinking it. The thymus theory was disproved in the 1980s. Researchers had been treating a normal sized thymus and not an enlarged one. The research data that had been used to develop a baseline for the size of the average thymus did not represent a cross section of the population. One innocent, unnoticed bias in data collection, that is all it took; researchers realized they had been wrong for almost a century (East Carolina University Department of Medical Humanities).

Early researchers also considered that sleep apnea, short periods of not breathing during sleep, or other abnormalities of breathing control were related to SIDS. As mentioned earlier, SIDS was not coined until the 1960s when it was declared a medical disorder. A thesis by Dr. Alfred Steinschneider titled “*Prolonged Apnea and The Sudden Infant Death Syndrome: Clinical and Laboratory Observations*” was accepted and published by the American Academy of Pediatrics in 1972. The thesis was based on the Hoyt family who had lost five children before they were six months old. According to the book *The Death of Innocents*, Steinschneider’s findings were not supported by medical records of the infants he used in his research. Several of the nurses who were assisting in the research informed Steinschneider that they suspected Hoyt was harming her children, but the doctor ignored their concern. It was later discovered that Hoyt suffered from Munchausen’s Syndrome by Proxy (MSP). Munchausen Syndrome by Proxy, also called Factitious Disorder by Proxy (FDP), is a psychological disorder characterized by a pattern of behavior in which a mother induces physical ailments upon her child (Schreier). According to Schreier, the mother attempts to gain attention and recognition

for herself by putting on the public façade of a dedicated and loving mother. However, when alone with her child, she will subject her child to abuse, both physical and emotional, as she tries to deliberately make her child sick. Steinschneider's flawed and manipulated SIDS research, which held up for more than twenty years by scientific error may have inadvertently helped conceal an untold number of infanticides and delayed future SIDS research (Firstman).

When Dr. Steinschneider started his research into prolonged sleep apnea in 1970, five thousand infants per year were dying without any medical explanation in the United States (American SIDS Institute 1983). Steinschneider's thesis claimed that his hypothesis on prolonged apnea, a physiological component of sleep, is "part of the final pathway resulting in sudden infant death" (Steinschneider 646). The thesis further claimed that infants might be identified prior to a deadly episode. The Hoyt infants, which were the basis of Dr. Steinschneider's thesis, would be re-classified as homicide twenty years after they were diagnosed as dying of SIDS.

Dr. Alfred Steinschneider suggested in 1972 that he could predict which infants might die of SIDS. Based on his study of babies at Upstate Medical Center in Syracuse New York, Steinschneider claimed that his research showed that otherwise healthy infants could experience pauses of breathing during sleep, a condition he called apnea. Steinschneider theorized that prolonged apnea events could lead to SIDS. The thesis further asserted that apnea monitors were necessary to detect apnea events in sleeping infants. The apnea theory catapulted Steinschneider into the forefront of SIDS research, led hundreds of thousands of parents and pediatricians to wire their babies to monitors, and shaped the way a generation of doctors, police, and prosecutors looked at SIDS

(Firstman). The Hoyt case, along with others where homicide was thought to have been misdiagnosed as SIDS, has given new strength to those who always suspected parents of being responsible for a high proportion of deaths of infants who die suddenly and unexpectedly. A commentary written in *Pediatrics* in 1997 attempted to justify why the journal published Steinschneider's thesis when there were indications at the time that his research might not have been valid. The author of the commentary contends that the question of undetected homicides during the period should be viewed in the context of what was known about SIDS (American Academy of Pediatrics, "Wrong Turns in Sudden"). As mentioned earlier, it took almost twenty years before the concepts of infants being harmed by caretakers would be generally accepted. The Steinschneider thesis led directly to the use of cardiorespiratory monitors to prevent SIDS, which current research now shows has no scientific correlation to reducing the number of SIDS deaths in the United States (American Academy Of Pediatrics, "Apnea, Sudden Infant" 656). The fact that a prestigious medical journal could publish a paper that had so much influence and yet turned out to be so wrong is justification that the criminal justice process proceed with its own established guidelines and procedures and not rely on present science to guide investigations. An example of this in the Hoyt case is that the mother who was diagnosed with Munchausen Syndrome by Proxy during her trial in 1995 had killed five of her infants twenty years prior. According to the text *The Death of Innocents*, the syndrome was not used to diagnose mothers until 1977. At present Munchausen Syndrome by Proxy theory is deemed just as unreliable as the apnea theory.

Munchausen Syndrome by Proxy was used by an English pediatrics researcher, Sir Roy Meadow, in 1977 when he published his observations in the *British Medical*

Journal in a thesis that was titled, “Munchausen Syndrome by Proxy: The Hinterland of Child Abuse” (Firstman). The paper described mostly women who faked or caused illnesses in their own children to gain attention. Meadow, an expert on Sudden Infant Death Syndrome at the time, suggested that some victims of SIDS were wrongly diagnosed and may actually have been victims of parental abuse (Meadow, “Mothering to death” 361). According to Meadow, doctors, coroners, and the police were literally helping abusers get away with murder by buying into the apnea and heredity theories that came about during the early 1970s, after Steinschneider published his thesis. According to Firstman, Meadow accused those involved in SIDS investigations of being under pressure to resolve unexplained infant death cases swiftly and without controversy. That was the reason why he believed investigators were resorting to diagnosing SIDS even when there were clear signs of child abuse. An article Meadow wrote, “Unnatural Sudden Infant Deaths”, published in the BMJ journal Archives of Disease in Childhood, quoted him as saying that “SIDS has been used, at times, as a pathological diagnosis to evade awkward truths.” (Meadow 2).

The controversial Munchausen syndrome by proxy claim proposed by Meadow was based on his study of records, spanning eighteen years, of eighty-one children from around Britain judged by criminal and family courts to have been killed by their parents. In forty-nine cases the children had initially been certified as dying from SIDS and twenty-nine were classified as dying from other natural causes. The mother was responsible for the death, usually smothering, in more than 80% of cases (Meadow, “Suffocation, recurrent apnea”).

However, just as with Dr. Steinschneider’s SIDS theory, new research has raised

doubt on the expertise and research techniques that Meadow used to establish his findings. Researchers are now claiming that the criminal justice system's determination to protect children is leading to a reversal of the burden of proof in the courts. That mothers whose babies die in unexplained circumstances are being asked to prove their innocence in front of a jury, and that women have been wrongfully convicted of murder. For this reason SIDS investigators should not blindly rely on current theories that may be disproved or deemed invalid at a later date, due to improper research techniques or ethics. Investigators instead should be held accountable to well established guidelines and protocols that adhere to procedures for investigations that take into account aspects of the infant, parents, and the death scene (Schreier).

Examples of the harms that can be caused when proper investigative procedures are not adhered to are evident in several infanticide cases that were a direct result of the Munchausen theory developed by Meadow. According to an English newspaper, the *Sunday Times*, Meadow was accused of causing the wrongful convictions of three mothers who were convicted of murdering their infants. Meadow argued for the prosecution that a statistical formula that he developed as part of his Munchausen theory showed that the chances of the women losing two infants to SIDS were one in seventy three million(*Sunday Times*). According to the article, Meadow's claim was disputed by the Royal Statistical Society, who wrote to the appellate judge that there was "no statistical basis" for the figure. The appeals' court criticized Meadow as being grossly misleading and manifestly wrong. It is ironic that Meadow's research which was aimed at disproving the works of Steinschneider's SIDS theories would be proven to be just as unethical and flawed. The literature shows that after Meadow's research, those involved

in SIDS cases started to expand their theories to include different aspects of the mother and environment.

A book titled *CRIB Death: Sudden Infant Death Syndrome* lists various maternal factors as possible causes of SIDS. The text includes maternal psychoses and sociopathic behavior. According to Guntheroth, a substantial number of SIDS victims were the victims of post-partum depression. The author argues that there are well documented tragedies of women who are pathologically depressed after delivery to the point of suicide. One noted researcher, Solomon Asch, analyzed the psychodynamics of these mothers to show that the infant is seen in the disturbed mother as an extension of herself and therefore the mother believes that she is destroying herself and not her child (Guntheroth).

Guntheroth claims that the non-psychotic but socially unacceptable behavior of mothers has been shown to affect the rate of SIDS. He points to a study conducted in 1972 of mothers who were drug dependent. The study reported three sudden infant deaths of fourteen women whose infants died while they were under a methadone maintenance program. Guntheroth says that this number of deaths is significant because the prevalence in the general population is only two per thousand.

Recent SIDS Theories / Research

The National Institutes of Health spends \$76 million a year on SIDS research. Since a public-health campaign began in the early 1990s to focus on prevention of risk factors such as putting the baby to sleep on his or her stomach and exposure to secondhand smoke, SIDS deaths have dropped more than 50%, according to the (American Academy of Pediatrics, “The Changing Concept of Sudden”). Some researchers caution that the

claimed 50% reductions may be the result of the way SUID have been reclassified.

Regrettably, SIDS epidemiology researchers admit that they are no closer to detecting the mechanisms that cause SIDS. The Ninth SIDS International Conference held in Japan in 2006 concluded the following: “The cause of SIDS is still not known, there are no tests that can be performed on infants which will predict SIDS, and that SIDS appears to be the result of a natural process. Recent pathology studies of SIDS infants support the view that these infants possess underlying vulnerabilities that put them at risk for SIDS” (Keens 7).

The natural process theory of SIDS proposes three interactions, or what Keens calls “The Triple Risk Model of SIDS”, that may come together to cause infants to die of SIDS (Keens 3). The three risk factors are a vulnerable infant, a critical developmental period, and external stressor(s) which are unknown and are responsible for triggering the other two factors (Filliano and Kinny). According to this model an infant will die of SIDS only if he or she possesses all three factors.

Additional maternal factors surrounding infant deaths are risks associated with the baby being born outside a hospital. Among homicides occurring on the first day of life, 95% of the victims were not born in the hospital (Overpeck 1211). Other maternal risk factors, according to Overpeck, include a second or subsequent infant born to an unmarried teenage mother, no prenatal care history, a mother with twelve or fewer years of education, and premature birth. An important concept of the “Triple Risk Model” is that it supports the idea that SIDS infants are not healthy prior to their deaths. Investigators of SUID cases could use this model to help rule out other possible causes by reviewing prenatal, neonatal medical records, and environmental or scene factors.

Trumbull County - 2001 SIDS Case Investigation

Between 1968 and 1972, at the height of Dr. Steinschneider's SIDS theory, a family in Trumbull County Ohio lost four infants to what authorities believed at the time was related to SIDS. The death certificates listed the cause of death in all four cases as SIDS. This author's investigation into the deaths revealed that a fifth infant had what medical records described as a near miss-SIDS. Near miss-SIDS was the term used by Steinschneider in his original apnea theory. According to current SIDS research the terms near miss-SIDS and aborted SIDS refer to ALTE and are not preferred terms any longer because they imply that an infant experiencing these events could have been saved if a caretaker intervened. SIDS babies on the other hand do not survive and experienced no ALTE before death, death being the first sign of any problem (Ariagno). Therefore, Ariagno believes that infants who experience ALTE and SIDS generally represent two different groups of infants. In the Trumbull County case, the surviving infant experienced five near miss-SIDS or ALTE during the first three months of life. The medical records that recorded the ALTEs would become the crucial evidence, twenty-nine years later that would convict the mother. The mother was convicted of two counts of attempted homicide and four counts of homicide involving the other four infants. This author's investigation revealed that no death scene investigations were initially conducted nor protocols followed in any of the four cases. Interviews with medical personnel and others involved in the four deaths pointed to the prevailing theories of SIDS as being largely responsible for the reasons why the deaths were not scrutinized further. In short, all four deaths fit within the then accepted medical theory of SIDS - multiple infant deaths, in the same family, was proof that SIDS was responsible. It was the same SIDS theory that

enabled the surviving child to endure child abuse that caused the five ALTE episodes that were recorded on the medical records with no intervention being taken. This author's investigation clearly showed that the infant survived because she was placed by her father with relatives in another state until she was fourteen months old. When the infant was returned to the mother, she was over one year old and out of the accepted age ranges for SIDS. The investigation revealed that no ALTE episodes occurred when the infant was being monitored in the hospitals or in the care of relatives.

Summary

This chapter reviewed the major literature related to SIDS and SUIDS cases that affected the primary theories and investigative practices during the last fifty to sixty years. Having knowledge about the many causes of SUID and SIDS is of utmost importance for death scene investigators. At the scene, the investigator will gather evidence as well as information from the parents or caregivers who were with the infant. All of this information is crucial for distinguishing between a natural death, an accidental death, or a homicide.

The review included some national and state efforts to standardize and improve the quality of data collection at infant death scene investigations and promote a more informed assignment of cause-of-death classification, but those efforts primarily addressed coroners and local child review boards. Law enforcement guidelines have not been mandated at the federal or state levels, although some suggested practices have been made.

The next chapter describes the methodology used in this thesis to review SUID cases from Trumbull County, Ohio from 2002 through 2009, the infant death cases this

author investigated, and cases described in the text “The Death of Innocents”.

CHAPTER III

METHODS AND DESIGN

The possibility that an infant’s death may be misdiagnosed as SIDS and not homicide through child abuse has sparked national concern. In the absence of complete scene investigation and the child’s medical information, even a complete autopsy cannot rule out such causes as asphyxia. As discussed earlier, this concern was addressed by the U.S. Senate and The U.S. House of Representatives who directed the U.S. Department of Health and Human Services to study the development of a standardized protocol for SUIDs. Identifying the factors that are consistent with SIDS as opposed to infanticide in SUID cases is necessary in order to prosecute offenders and to let innocent parents know that their child’s death was not their fault.

The methodology for this research involved identifying and describing those factors that have occurred in infant deaths of less than one year of age. It also examined factors related to the parents and the death scene.

The formatting of this thesis adheres to the “MLA Handbook for Writers of Research Papers” (Seventh Edition).

Instrumentation

The primary methods utilized to study the research questions will be qualitative. They include content analysis of published medical and law enforcement literature, agency policies, documents, records, and electronic databases. Case study analysis of at least eighteen completed death investigations of SUID related/suspected SIDS, homicide,

and accidental incidents provided by the Trumbull County Coroner's Office will be critically reviewed to reveal specific commonalities. Descriptive information through literature and case review was collected such as age, race, gender, manner of death, and cause of death. Other related factors analyzed were marital status of parents, caretaker status, previous SIDS in family, sleeping area, postpartum/medical history of mother, and caretaker (if alone at time of death).

Participant observation included the researcher's personal research and investigative experiences in conducting SIDS related child death investigations during the last nine years. The researcher's experience assisted in identifying unique factors or criteria to incorporate into recommended guidelines or protocols. These investigations spanned forty years and involved four incidents that resulted in four convictions, and now are a matter of public record.

The primary data collection instrument consisted of a large table containing twenty-four factors that the literature and this author's experience indicated were important to the investigation of SUID cases. This instrument is replicated in Appendix B

Sample and Data Collection

The intent of this research was to collect data from completed autopsy examinations and law enforcement death scene investigative reports. The Trumbull County Coroner's Office was selected and contacted. A meeting was held with the keeper of records and the Trumbull County Coroner to gain permission and conduct the case review. A signed informed consent letter was obtained. The Coroner identified thirty four cases from 2004-2009 that fit the predominant criteria of infant deaths this study was looking for, less than one year of age. From the sample of the thirty-four cases provided

by the Trumbull County Coroners office, eighteen cases were chosen because of two specific factors, manner of death and cause of death. For manner of death, only those cases ruled as accident, homicide, natural, and undetermined were included in the sample to be analyzed. For cause of death, only those that were classified as asphyxia, trauma, SIDS, and unknown were included. The selected variables for analysis were the only ones considered for this research because the literature review supports these factors as the ones being mostly associated with SIDS and SUIDs.

In addition to cases collected from the Trumbull County Coroner's Office, data was analyzed from the four infanticide cases investigated by the Niles Police in 2001. Permission was granted by the Chief of Police at the Niles Police Department to review all investigative materials, original scene reports, interviews, autopsy, and court proceedings. A signed informed consent letter was obtained. Five cases of ruled SIDS that were later re-classified as homicides and were depicted in the book *The Death of Innocents* were included in the sample for analysis also. Thus, a total of twenty-seven cases made up the sample for analysis.

Analysis

After content analysis of the twenty-seven cases was tabulated on the data collection instrument, the factors were subdivided into groupings representing the victim, the caretaker and the death scene. In addition to descriptive analyses of the data, Chi-square analyses, using SPSS, were then run on the tabulated non-parametric data associated with each grouping.

Summary

This chapter explained the basic data collection instrument used for this thesis as well as the sample of twenty-seven cases of SUIDs. Each case was reviewed to identify the twenty-four key factors associated with SUID investigations based on the literature review and this author's experience with such investigations. The next chapter presents the findings of the content analysis and the Chi-square tests run on the data.

CHAPTER IV

ANALYSIS AND FINDINGS

Descriptive statistics were used to analyze the data collected. There were eighteen sudden unexplained infant death cases reviewed from Trumbull County, four cases from the Niles Police Department, and five cases from the text, *The Death of Innocents*. The analysis of factors for each case was divided into three major groupings. The major groups were victim related factors, parental/caretaker related factors, and scene/investigative related factors (see Tables 1, 2, 3).

The three groupings, when combined, account for the twenty- four factors on the data collection instrument. They represent the victim, the caretaker, and the death scene. As mentioned in the literature review, these three areas of investigative focus are necessary in any SUID cases in order to rule out the possibility that the death is not SIDS. This fits within the definition of SIDS, which is “the sudden death of an infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history” (National SIDS Resource Center).

All twenty-four factors were analyzed using SPSS statistical software. Of the twenty four factors, the majority were not found to be significantly related in the use of a protocol or the ruling of SIDS and non-SIDS. Therefore these factors would not be helpful developing a protocol for SUID investigations. The five factors that resulted in significant findings, age at time of death, prenatal development, infant healthy prior to death, autopsy performed, and protocol used will be discussed in detail.

All of the infants in the sample were under one year of age, except for one infant who was twenty four months old. This child was excluded from that statistical analysis but will be discussed because he is relevant, being one of four infants that were ruled SIDS in the same family. The analysis begins with a synopsis of the three major groups of factors. Then victim related factors, parental/caretaker related factors, and scene/investigative related factors are discussed. Following this assessment there is an in-depth analysis and discussion of the significant findings.

Analysis of Victim Related Factors

Most, 70.4%, of the infants sampled were between the ages of zero and four months of age; 18.5% of the infants were five to eight months old; and 11.1% were nine to twelve months old. The majority, 88.9%, of infants were caucasian compared to non-white who accounted for 11.1%. There were slightly more male (55.6%) than female (44.4%) infants who were sampled for this study. The manner of death listed as natural was 33.3% of the sample, compared to accident at 22.2%, undetermined at 11.1%, and homicide at 7.4%. For cause of death, the majority ruling was SIDS (59.3%), asphyxia (29.6), unknown (7.4%), and trauma (3.7%) (see Table 1).

Table 1**Victim Related Factors**

Variable	Value	Number n=27	Percent
Age	0-4mo	19	70.4%
	5-8mo	5	18.5%
	9-12mo	3	11.1%
Gender	Male	15	55.6%
	Female	12	44.4%
Race	White	24	88.9%
	Non-White	3	11.1%
Manner of Death	Accident	6	22.2%
	Homicide	2	7.4%
	Natural	9	33.3%
	Undetermined	3	11.1%
Cause of Death	Asphyxia	8	29.6
	Trauma	1	3.7%
	SIDS	16	59.3%
	Unknown	2	7.4%

Analysis of Parental/Caretaker Related Factors

The analysis of this group of factors revealed some interesting findings, even though the findings were not significant for the purpose of using them to help create protocols or guidelines. Slightly more mothers, 55.6%, were in the lowest age group, sixteen to twenty-one years of age. While 33.6% of the mothers were in the twenty-two to twenty-five age group, only 11.1% of the mothers in the cases sampled were over the age of twenty six. These findings were somewhat lower than expected. The literature reviewed indicated that younger mothers have a greater risk of SIDS occurring to their infants than older mothers. The CDC reported that mothers twenty one and younger account for 23% of SIDS deaths and 17% of SUID deaths while accounting for only 13% of live births in the US in 2003. When SIDS and SUID rates are added together, they account for 47% of all infant deaths for this age group (Centers for Disease Control, “Infant Mortality Statistics from the 2004”).

Marital status of mothers at time of death revealed that 44.4% were married and 56.4% were not. This finding seems to agree with the traditional risk factors of SIDS and SUID. According to national vital statistics, infants of unmarried mothers are 1.6 times more likely to die of SIDS and SUID than those born to married mothers (Centers for Disease Control, “Infant Mortality Statistics from the 2004. Caretaker status is reflective of who was caring for the infant at time of death. As expected, 85.2% of the time mothers were caring for the infant at the time the infant was discovered dead. Only 7.4% of the time was the father the caretaker. In another 7.4% of the time, it was a relative or babysitter. This finding is consistent with the fact that most mothers are the main caretakers for their infants whether they are married or not.

In 88.9% of the cases, the infant's caretaker was alone at the time death occurred, compared to 11.1% of the cases when the infant was with others. This finding was an expected outcome of the samples. The literature reviewed indicated that the majority of the time the mother is the sole caretaker. This coincides with the finding that these mothers are unmarried and of a young age, also as indicated in the literature review.

The maternal medical records of the infant cases reviewed noted postpartum issues if any, APGAR score, and whether the mother smoked. All three issues were of no determinant significance in detecting SIDS for the purpose of using this information in a protocol. For postpartum issues, the medical records revealed that 96.3% of the mothers were not diagnosed with the syndrome. Only one case (3.7%) reviewed, revealed that the mother was diagnosed as having suicidal thoughts prior to her infant dying of SIDS. The APGAR score, which is an indication of prenatal infant health, indicated that 55.6% of infants were in the normal range and no infant was below the normal. Scores for twelve infants (44.4%) were not detected in the medical records, but it could be assumed that the results would be similar to those in the normal range since no other medical issues were noted.

The variable of mothers who smoke resulted in a similar outcome. Mothers who are reported to be smokers have a higher risk factor for SIDS (American Academy of Pediatrics, "The Changing Concept of Sudden Infant"). The sample revealed that slightly over half (59.3%) of mothers smoked. Only six of the twenty-seven mothers or 22.2% did not smoke and five (18.5%) were not reported. It is suspected that this might have been a significant finding if the five cases had been reported in the medical records (see Table 2).

Table 2**Parental/Caretaker Related Factors**

Variable	Value	Number n=27	Percent
Age-Mother Years	16-21	15	55.6%
	22-25	9	33.3%
	26 +	3	11.1%
Marital Status	Married	12	44.4%
	unmarried	15	56.4%
Caretaker	Mother	23	85.2%
	Father	2	7.4%
	Other	2	7.4%
Caretaker Alone	Yes	24	88.9%
	No	3	11.1%
Postpartum	Yes	1	3.7%
	No	26	96.3%
APGAR Score	0-5 Below Normal	0	0%
	6-10 Normal	15	55.6%
	Not Reported	12	44.4%
Mother Smokes	Yes	16	59.3%
	No	6	22.2%
	Not Reported	5	18.5%

Scene/Investigative Related Factors

Scene and investigative factors are those that deal with the SUID scene itself. The death scene investigation is an essential element in the process of determining an accurate cause of death in SUID related cases. Inaccurate classification of the cause and manner of death impedes not only the criminal justice process, but also prevents efforts by limiting researchers' ability to accurately identify risk factors for SIDS and other SUID causes (Mendoza).

Table 3 shows possible factors that are either collected directly from the SUID death scene or from interviewing the infant's caretaker at time of death. The samples analyzed for this study revealed that infants died the great majority (81.5%) of the time in their cribs. Infants who were discovered dead on furniture such as a couch or over-size chair occurred only 14.8% of the time. While this number does not seem significant, research shows that nearly 50% of all infant deaths are the result of parents sleeping with their children on couches and their beds (Centers for Disease Control, "Infant Mortality Statistics from the 2004"). Overlaying accidents can only be discovered by a detailed scene investigation that includes an interview of the caretaker. This is necessary because parents will often attempt to hide these facts. Other sleep areas such as floors accounted for only 3.7% of the infant deaths in this study. This might be because most parents do not place their infants on floors to sleep or because there is no place an infant can become wedged and suffocate on the floor.

An unexpected outcome of this study related to sleep position. Research shows that the majority of the time infants are either placed prone face down or supine face up. There is a great deal of research and continuing debate on this matter. Even though the

cause(s) of SIDS are unknown, the CDC, the American SIDS Institute, and the American Academy of Pediatrics all agree that placing an infant on his or her stomach are important risk factors. According to several studies, the risk of SIDS increases 2.4 to 9.3 times for these infants (The Centers for Disease Control, "Infant Mortality Statistics from the 2004"). Data collected in this study for the position in which infants are placed to sleep revealed a non-significant finding. Prone sleeping accounted for 22.2% of the sample compared to stomach sleeping at 44.4%. Nine cases that were reviewed did not list sleep position and they accounted for 33.3% of the sample.

The unreported data from these cases is further indication that a specific and detailed scene investigation is necessary for accurate reporting of SIDS deaths for law enforcement and SIDS prevention research.

Apparent Life Threatening Events (ALTE) in infants prior to death was tested to see if they showed any correlation in detecting SIDS from non-SIDS. The outcome of the analysis resulted in the samples being almost equally divided. Fourteen cases or 51.9 % showed some type of ALTE, while thirteen cases, 48.1 %, reported no prior events. During the 1970s, researchers called ALTE near-miss SIDS. According to present day researchers the term is misleading because it implies a close association to predictive SIDS. Most of the literature presented suggests that ALTEs are not predictive of infants dying of SIDS. According to the American SIDS Institute, the estimated risk of SIDS in a population of infants with ALTE is 1% (American SIDS Institute)

"Purge," or the pink frothy discharge from the mouth, is often found on the sleep area of an infant suspected to have died of SIDS (American Academy of Pediatrics, "The Changing Concept of Sudden Infant"). Some researchers believe that purge might aid in

the diagnosis of non-SIDS deaths. The sample tested revealed that just over half (55.6%) noted some type of bodily discharge from the nose or mouth. Almost as many cases (44.4%) failed to note any purge at all. Although this finding is not significant to show a direct relationship to SIDS, the absence or presence of certain types and colors of purge can aid in a final diagnosis of SUIDs. For instance, if whole blood, (bright red in color), is found on bedding or on the infant's nose or mouth, and it cannot be related to cardiopulmonary resuscitation, then most likely it is not SIDS (Krous 348).

Table 3

Scene/Investigative Related Factors

Variable	Value	Number n=27	Percent
Sleep Area	Crib	22	81.5%
	Couch	4	14.8%
	Floor	1	3.7%
Sleep Position	Prone	6	22.2%
	Stomach	12	44.4%
	Unknown	9	33.3%
ALTE	Yes	14	51.9%
	No	13	48.1%
PURGE	Yes	15	55.6%
	No	12	44.4%
Prior SIDS	Yes	8	29.6%
	No	19	70.4%
Protocol Use Noted	Yes	4	14.8%
	No	23	85.2%

Correlations/Significant Findings of the Data Set

Infant's Age at Time of Death. Table 4 reflects the age distribution of the cases at time of death. Well over half (93%) of the infants were under the age of six months old at time of death. The analysis shows that only 12 % of the sample was between the ages of seven and twelve months. One infant (2.5%) in the sample was 24 months old. The large

Table 4

Age Distribution at Time of Death

Age-Months	Number	Percent
.25	3	11.1
.50	4	14.8
1.00	3	11.1
2.00	6	22.2
3.00	2	7.4
4.00	1	3.7
5.00	3	11.1
6.00	2	7.4
11.00	1	3.7
12.00	1	3.7
24.00	1	3.7

percentage of SIDS occurring before six months of age in the cases sampled is unique in that the distribution agrees with the literature presented. According to the CDC, more than 95% of SIDS occurs in infants that are under six months of age. SIDS deaths occurring in infants under four months of age were slightly lower (70.4%) in the sample of this study than they are for this age distribution reported by the CDC at 75.9 (see table 5).

Infants in the sample under one month of age represented 26% of the cases, while infants over nine months of age accounted for 11% of SIDS related deaths. This appears to be a significant finding. According to the National Institute of Child Health and Human Development (NICHD), SIDS is much less likely to occur in infants before they reach the age of one month and after the age of nine months. This is also apparent in table 4 where age of death is grouped in categories. The age range from zero to four months accounts for 70.4% of the cases, while nine to twelve month old infants represent only

11.1% of cases. These age groups at time of death are very similar to the percentages reported by the NICHD and the CDC.

Table 4 illustrates the statistical correlation of age of infant at time of death with SIDS being ruled the cause of death. Any infant death over nine months of age most likely is not SIDS. This finding could assist investigators in ruling out non-SIDS deaths when used in conjunction with other related variables.

Table 5

Age of Infant at Death

Age Months	Number	Percent
0-4	19	70.4%
5-8	5	18.5%
9-12	3	11.1%
$X^2=8.02,df=2,P<.05$		

Prenatal Development of the Infant. Normal prenatal development was noted in the majority (92.6%) of the cases. While below normal development represented only 2% of the sample. Analysis of this variable revealed that prenatal development was correlated with SIDS being ruled the cause of death. Infants below normal prenatal development were more likely to have died of SIDS than those with normal prenatal development (see Table 5). The findings are consistent with the “Triple Risk Model of SIDS” reported by the Ninth SIDS International Conference conducted in 2006. As mentioned in the literature review, the model supports the concept of infant vulnerability, that SIDS victims are not entirely normal prior to death, but rather possess underlying

vulnerabilities that might predispose them to SIDS (Keens 7).

Table 6

Prenatal Development of the Infant

Valid Sample	Number	Percent
Below Normal	2	7.4%
Normal	25	92.6%
$X^2 = 5.13, df=1, p \leq .02$		

Health of Infant Prior to Death. Recently developed theories of SIDS place the health of the infant prior to death as a major factor in the occurrence of SIDS and SUID. Currently, researchers believe that sixty to seventy percent of infant deaths that fall within the definition of SIDS are related to some type of chronic abnormality (American SIDS Institute). In this study, 18.5% of the infants were healthy prior to death, while 81.5% of the sample had some type of reported health problem. This is a very significant finding when ruling out SIDS. If a review of the infants medical history indicates a healthy infant prior to death, the finding will less likely be SIDS (see Table 4). This variable (Health of Infant Prior to Death) is not to be confused with (ALTE) which is much different. ALTE is seen more as a syndrome that has not been linked to SIDS, while the Health of the Infant is a diagnosed abnormality and can be detected with an autopsy. This variable can also assist in excluding SIDS from non SIDS deaths.

Table 7

Health of Infant Prior to Death

Valid Sample	Number n=27	Percent
Healthy	22	81.5%
Not Healthy	5	18.5%
$X^2=7.47, df=1, p<.05$		

Was the Use of a Protocol Noted? Table 7 illustrates the statistical significance when the use of a protocol was tested as a variable for the ruling of SIDS or non-SIDS. Protocol use by scene investigators was noted only 14.8% of the time. Almost all (85.2%) of the cases reviewed showed that no investigative scene protocol was used. The analysis shows that in the absence of a protocol being used, the ruling was more likely to be SIDS or asphyxia than other rulings. When a protocol was used, SIDS was not the likely ruling (see table 8).

All of the other variables were analyzed to determine if they were correlated with the determinant cause of death. None were found statistically significant. This does not mean that they aren't important, just not significant in this study. But keep in mind that since protocols were seldom used, it can still be assumed that the cause of death in some cases was ruled SIDS incorrectly.

Table 8

Was the Use of a Protocol Noted?

Valid Sample	Number n=27	Percent
Yes	4	14.8%
No	23	85.2%
$X^2=8.68, df=3, p<.05$		

Summary

This study indicates that there is a low level of protocol use by SUID scene investigators that needs to be addressed, not only in Trumbull County, but in other areas of the US. The use of protocols impacted the results of the autopsy; when protocols were noted the ruling was more likely to be non-SIDS. A healthy infant prior to death and normal prenatal development also seemed to correlate with a ruling of non-SIDS. Age of the infant at time of death also turned out to be an important factor in diagnosing non-SIDS. This study found that an infant who is over nine months of age, most likely the death is not a result of SIDS. These factors seem to agree with the literature, and the approach that SIDS is seen as a diagnosis of exclusion.

CHAPTER V

LIMITATIONS, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this study was to review the literature to see what or if any investigative protocols and guidelines existed for SUID and SIDS investigations, to analyze completed SUID and SIDS cases, and to develop law enforcement investigative guidelines for unexplained infant deaths.

Limitations of the Study

As with any research, limitations existed in this study. Here limitations existed in gathering data from incomplete or in some cases non-existent SUID scene investigative, medical history, and/or autopsy reports. In addition, every jurisdiction has their own way of investigating SUIDS and ruling on those deaths. This makes it difficult to compare and contrast data with other jurisdictions.

For example, sleep position at time of death was not reported in seven cases, this being an important factor in current SIDS research. For medical history, limitations existed for mothers of the infants. Only one mother was noted as having postpartum issues. It is unknown if the other twenty-six mothers had a diagnoses of postpartum depression issues because it was not noted.

Autopsy limitations also existed for the samples analyzed. Seven cases had no manner of death listed, and three had cause of death listed as undetermined. Nine of these cases had SIDS listed for manner of death, and one was listed as undermined. In each one of these cases, no protocol use was noted. No scene investigation protocol use might be the reason why the deaths were ruled in this manner.

As mentioned in the literature review, the determination of SIDS has changed

over time and is further dependent on which jurisdiction conducts the SUID investigation. This limitation is evident. One infant included in this study was twenty-four months of age, but was included in the analyses because he was one of five infants in the same family whose cause of death was ruled as SIDS. This is mentioned here because it could have a minor impact on the analysis of the factors.

Finally, limitations exist in the way the samples were selected. Eighteen SUID cases reviewed were from Trumbull County in the last five years. Four cases also from Trumbull County occurred from 1968 to 1972 and five cases also during this time period were investigated in Syracuse, New York. This poses a problem in determining if the limited use of SUID scene protocols are localized to Trumbull County or are still a present day problem.

Implications

It appears from the research that Trumbull County, like most other jurisdictions, has a problem of not using a standardized SUID scene protocol. It should be noted that when death scene investigators don't use such protocols, inconsistent and incomplete information will be available to the coroner who is the final determinant for cause and manner of death. This could lead to a miscarriage of justice if the finding of death fails to differentiate between fatal child abuse and other possible SUID findings. Further implications could be those associated with public health. In Ohio and many other states it is required by law that counties forward all SUID cases to that state's department of health. The analysis of these reports can benefit health professionals, coroners, and law enforcement investigators across the entire state.

In the absence of a required protocol that details how a SUID scene is

investigated, many factors that would aid SUID and SIDS research can go unrecognized. This could possibly delay further understanding of SIDS and SUIDs. An excellent example of this is the research that was done on infant sleep position. This type of information can only be noted by the scene investigator. In this study nine of the twenty-seven cases sampled did not list in what position the infant was found at time of death. Even though the infant might have been moved or transported to the hospital, investigators could still gather the information by conducting interviews of caretakers as would be required by a protocol.

Future Research

It is suggested that continued research be conducted on this subject, particularly at the state level. The state receives reports from across Ohio, but it is not clear what analyses are conducted on those reports. The cases collected statewide might clearly indicate a need for a detailed investigative protocol for law enforcement personnel. The purpose would not be to necessarily impose a state mandate, but rather to improve training and dissemination of suggested investigation guidelines.

Recommended Interim Investigative Guidelines

The two main objectives of law enforcement sudden infant death scene investigations are to generate a single reasonable theory for cause and manner of death and to assist the forensic pathologist or coroner in making his or her ruling. Because SUID investigations involve parents who have just lost their child, investigators should approach them in a sensitive, non-accusatory manner. The initial contact should be more interview than an interrogation in nature. Occasionally some investigators mistake natural factors as signs of child abuse and innocent parents are made victims a second time. For

example, lividity is mistaken for bruising, purge is mistaken for blood caused by trauma, and even diaper rash at times is mistaken for trauma. The following recommendations are the result of the literature reviewed for this study, the analysis of the data collected and the author's experience and training in conducting such investigations. The lists include recommended steps to be taken by an investigator or the types of information that should be documented during the initial investigation.

Initial Contact–Parents/Caregivers

1. Investigators should approach parents/caregivers in an interview posture.
2. Initially parents/caregivers should be permitted to tell their story without interruption describing the circumstances surrounding the death (much of the information needed will be ascertained with this technique).
3. Where circumstances surrounding the infant's death need clarification, the investigator's questions should be neither inflammatory nor accusatory (the goal here is not to reinforce guilt feelings that parents/caregiver might have it could cause them to become resentful and uncooperative).

Victim/Scene Information:

1. Age, date of birth, birth weight, race, and sex.
2. Who was last person to see infant alive (date and time)?
3. Who discovered the dead infant?
4. Place of death (crib, parent's bed, couch, other areas of the house).
5. What was the position of the infant when found dead (on back, stomach, side)?
6. Was the infant's original position changed (why and by whom)?
7. Was resuscitation attempted (by whom, method used)?

8. Was the infant sick prior to death (flu or cold symptoms, or related illness, a complete review is required to discover other health related issues)?
10. Apparent Life Threatening Events (how severe and how many episodes; consider verification through medical/hospital records)
12. Was parent/caregiver alone with infant at time of death?
13. Prior SUID/SIDS in family (ascertain who was with these prior victims).

Maternal/Factors

1. Age of mother
2. Marital status (married, single, divorced)
3. Medical records review (postpartum, smoker, prenatal health issues)

(Note: Medical records require subpoenas before investigator review however, coroners may obtain some records during case review.)

Summary

This study indicated there are problems in the way SUID investigations are conducted in one county in Ohio. It appears this is the result of a lack of suggested or required protocols for SUID scene investigators. Further research should focus on developing a statewide and possibly a national standardized protocol that is user friendly and geared toward law enforcement. These guidelines should set the stage for standardized investigative procedures, data collection instruments, and training for SUID scene investigators.

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Appendix A
Informed Consent Letter

Youngstown State University

Criminal Justice & Forensic Sciences Department

INFORMED CONSENT LETTER

TO: The Official in Charge of Records:

We are conducting a study to develop law enforcement investigative guidelines for unexplained infant deaths. These guidelines would be proposed for the initial and so called “routine death investigation” that is performed by on-scene law enforcement investigators. In this study, you will be asked to provide selected case files related to unexplained infant death cases in Trumbull County. Your participation is limited to providing requested records for researcher review. The research methods employed will extract information/data contained in the records. The case files will then be returned. The names of individual victims, suspects, arrestees, and/or convicted individuals will NOT be collected. If clarification is needed for anything in the case files, the question(s) will be directed to you (the official in charge of the records). If that occurs, you may decide not to respond. It is also your right to withhold any confidential, non-public records from the researchers.

There are no risks to you for participating in this research. There are benefits to the County, to law enforcement agencies, and to society at large if the researchers succeed in developing investigative guidelines or checklists for the on-scene processing of incidents involving sudden unexplained infant deaths

All information will be handled in a strictly confidential manner, so that no one will be able to identify persons associated with the reviewed case files.

Other than the request for public records, your assistance with this study is totally voluntary and you may withdraw at any time without negative consequences. If you wish to withdraw at any time during the study, simply tell either of the researchers identified below.

Please feel free to contact me if you have any questions about the study. Or, for other questions, contact the Director of Grants and Sponsored Programs at YSU.

I understand the study described above and have been given a copy of the description as outlined above. I am 18 years of age or older and I agree to participate.

Signature of Participant

Date

Appendix B
Data Collection Instrument

Data Collection Instrument

	Sudden Unexplained Infant Death Case			
Factors	#1	#2	#3	#4
Autopsy				
Protocol Noted				
Neonatal Immunization				
Healthy Prior To Death				
DOA Age in Months/Days				
Gender				
Race				
ALTE				
Purge				
Manner of Death				
Cause of Death				
Age Mother				
Married				
Mother Smokes				
APGR				
Caretaker Status				
Caretaker Alone				
Prenatal Development				
Postpartum Status				
Place of Death @ Home				
Place of Death @Hospital				
Previous SIDS Family				
Sleep Area				
Sleep Position, Face Up or Down				

Appendix C

SUDDEN UNEXPLAINED INFANT DEATH

INVESTIGATIVE INDICATORS

SUDDEN UNEXPLAINED INFANT DEATH
INVESTIGATIVE INDICATORS

Factors Compatible With SIDS	Factors Less Compatible with SIDS
<ul style="list-style-type: none"> • Infants age 2-4 months * • Infant healthy prior to death * • Good prenatal development* • Normal APGAR score(6-10) • Purge frothy pinkish in color • Mother non-smoker • Safe sleep area • No prior SIDS/SUID in family • No signs /reports of child abuse • Infant dies at home • Back sleep position • No ALTE • Mother over twenty-five years old • No postpartum issues noted • Mother married 	<ul style="list-style-type: none"> • Infant less than one month of age* • Infant over nine months of age* • Infant unhealthy prior to death • Poor prenatal development • Poor APGAR score (0-5) • Purge bright red /whole blood • Mother smokes • Unsafe sleep area • Police/child services intervention • Caretaker alone at time of death • Same caretaker prior SIDS/SUID* • Signs of child abuse infant/scene • Evidence of positional asphyxia • Evidence of caretaker rollover • More than one ALTE*

SOURCE: These factors were developed using the literature reviewed, analysis of the cases sampled, and the author's personal experience in investigating SUID/SIDS Deaths.

Appendix D

Human Subjects Committee Approval

September 27, 2010

Dr. James A. Conser, Principal Investigator
Mr. Gaetano (Guy) Simeone, Co-investigator
Department of Criminal Justice and Forensic Sciences
UNIVERSITY

RE: HSRC Protocol Number: 025-2011
Title: The Development of Law Enforcement Investigative Guidelines for Unexplained
Infant Deaths

Dear Dr. Conser and Mr. Simeone:

The Human Subjects Research Committee has reviewed the abovementioned protocol and determined that it is exempt from full committee review based on a DHHS Category 4 exemption.

Any changes in your research activity should be promptly reported to the Human Subjects Research Committee and may not be initiated without HSRC approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the Human Subjects Research Committee.

The HSRC would like to extend its best wishes to you in the conduct of this study.

Sincerely,

Peter J. Kasvinsky
Dean, School of Graduate Studies and Research
Research Compliance Officer

PJK/cc

c: Atty. Patricia Wagner, Chair
Department of Criminal Justice and Forensic Sciences