

WARNING – This excerpt is intended for use by medical, legal, social service, and law enforcement professionals. It contains graphic images that some may find disturbing or offensive. Minors and/or nonprofessionals should not be allowed to access this material.



---

# Child Abuse

---

## *Pocket Atlas Series*

*Volume Five*  
*Child Fatality  
and Neglect*



**STM Learning, Inc.**

---

*Leading Publisher of Scientific, Technical, and Medical Educational Resources*

Saint Louis

[www.stmlearning.com](http://www.stmlearning.com)



## OUR MISSION

To become the world leader in publishing and  
information services on child abuse,  
maltreatment, diseases, and domestic violence.

We seek to heighten awareness of these issues  
and provide relevant information to  
professionals and consumers.

*A portion of our profits is contributed to nonprofit organiza-  
tions dedicated to the prevention of child abuse and the care  
of victims of abuse and other children and family charities.*



---

# Child Abuse

---

## *Pocket Atlas Series*

*Volume Five*

### *Child Fatality and Neglect*

**Randell Alexander, MD, PhD**

Professor of Pediatrics and Chief  
Division of Child Protection and Forensic Pediatrics  
Department of Pediatrics  
University of Florida  
Jacksonville, Florida



**STM Learning, Inc.**

---

*Leading Publisher of Scientific, Technical, and Medical Educational Resources*

Saint Louis

[www.stmlearning.com](http://www.stmlearning.com)

---

Publishers: Glenn E. Whaley and Marianne V. Whaley  
Graphic Design Director: Glenn E. Whaley  
Managing Editor: Paul K. Goode, III  
Print/Production Coordinator: Jennifer M. Jones and G.W. Graphics  
Cover Design: Jennifer M. Jones and G.W. Graphics  
Color Prepress Specialist: Kevin Tucker  
Acquisitions Editor: Glenn E. Whaley  
Developmental Editor: Paul K. Goode, III  
Copy Editor: Paul K. Goode, III  
Proofreader: Paul K. Goode, III  
Editorial/Publishing Consultant: Kerry Blasingim

Copyright © 2016 STM Learning, Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher.

Printed in the United States of America.

Publisher:  
STM Learning, Inc.  
Saint Louis, Missouri  
Phone: (314) 434-2424  
<http://www.stmlearning.com> [orders@stmlearning.com](mailto:orders@stmlearning.com)

The Library of Congress has cataloged the printed edition as follows:

Names: Alexander, Randell, 1950- editor.  
Title: Child fatality and neglect / [edited by] Randell Alexander.  
Other titles: Child abuse pocket atlas series ; v. 5.  
Description: Florissant, MO : STM Learning, Inc., [2016] | Series: Child abuse pocket atlas series ; volume 5 | Includes bibliographical references and index.  
Identifiers: LCCN 2016020165 (print) | LCCN 2016020732 (ebook) | ISBN 9781936590629 (pbk. : alk. paper) | ISBN 9781936590674 (ebook)  
Subjects: | MESH: Child Abuse | Fatal Outcome | Infant | Child | Case Reports | Atlases | Handbooks  
Classification: LCC RC569.5.C55 (print) | LCC RC569.5.C55 (ebook) | NLM WA 17 | DDC 616.85/8223--dc23  
LC record available at <https://lcn.loc.gov/2016020165>

---

## CONTRIBUTORS

**Mary E. Case, MD**

Professor of Pathology  
Saint Louis University Health Sciences Center  
Saint Louis, Missouri  
Chief Medical Examiner  
Saint Louis, Saint Charles, Jefferson, and  
Franklin Counties

**Lora Darrisaw, MD**

Associate Medical Examiner  
Pediatric and Forensic Pathology  
Georgia Bureau of Investigation  
Child Abuse Investigative Support Center  
Decatur, Georgia

**Kathleen Diebold, MA**

Manager of Forensic Operations  
Saint Louis University  
Division of Forensic & Environmental  
Pathology  
Chief Investigator/Child Death Specialist  
Saint Charles, Jefferson, and Franklin Counties  
Medical Examiner's Office  
Saint Louis, Missouri

**Kenneth W. Feldman, MD**

Clinical Professor of Pediatrics  
University of Washington  
Medical Director  
Child Protection Team  
Children's Hospital & Regional Medical Center  
Seattle, Washington

**Edward Goldson, MD**

Professor  
Pediatrician  
Department of Pediatrics  
University of Colorado School of Medicine  
Denver, Colorado

**Tamara M. Grigsby**

Captain, Medical Corps, United States Navy  
General Pediatrician and Child Abuse Specialist  
Naval Health Clinics Hawaii  
Tripler Army Medical Center  
Pearl Harbor, Hawaii

**Randy Hanzlick, MD**

Chief Medical Examiner  
Fulton County, Georgia  
Professor of Forensic Pathology  
Director, Forensic Pathology Training  
Emory University School of Medicine  
Atlanta, Georgia

**Michael Pines, PhD**

Psychologist  
Director, School Mental Health Center  
Division of Student Support Services  
Los Angeles County Office of Education  
Founder and Co-Chair  
Los Angeles County Child & Adolescent  
Suicide Review Team  
Downey, California

**Linda Quan, MD**

Professor  
Division of Pediatric Emergency Medicine  
Department of Pediatrics  
University of Washington School of Medicine  
Attending Physician  
Emergency Services  
Children's Hospital & Regional Medical Center  
Seattle, Washington

**Lakshmanan Sathyavagiswaran,****MD, FRCP(C), FACP, FCAP**

Chief Medical Examiner-Coroner  
Department of the Coroner  
County of Los Angeles, California  
Clinical Professor at Keck School of Medicine  
University of Southern California  
Clinical Professor at Geffen School of Medicine  
University of California, Los Angeles  
Los Angeles, California

**Andrew Sirotiak, MD, FAAP**

Professor of Pediatrics and Vice Chair for  
Faculty Affairs  
Department Head, Child Abuse and Neglect  
University of Colorado School of Medicine  
Director, Child Protection Team  
Children's Hospital Colorado  
Aurora, Colorado

---

## PREFACE

While people have always wondered how children die, it is only in the last 40 years that interdisciplinary teams have been created formally to understand deaths and to consider methods of prevention. Previous efforts to address individual causes of child death now are being supplemented by a more systematic approach.

In 1994, I was the guest editor of a special issue of the American Professional Society on the Abuse of Children's newsletter, the *Advisor*. It was titled "Special Issues on Child Fatalities" and had contributions from multiple authors, some of whom are included in this book. In 1995, the US Advisory Board on Child Abuse and Neglect issued an important work titled *A Nation's Shame: Fatal Child Abuse and Neglect in the United States*. Although focusing only on child abuse deaths, its incisive findings and recommendations for child death review are (sadly) just as relevant years later.

In creating this book, certain goals were paramount: determine a comprehensive outline of the fields and issues involved in child deaths and death review, consider more strongly all causes of death beyond what some teams have as their focus, assemble top authors in their respective fields, and include an international perspective. The photographic chapters in this book depict many of the possible manners of death in children and allow interdisciplinary team members who may have limited experience with actual deaths and autopsies to better understand the findings in such cases. With a wide range of detail about child fatalities, this reference will help these dedicated professionals to better understand and prevent the deaths of children.

### **Randell Alexander, MD, PhD**

Professor of Pediatrics and Chief  
Division of Child Protection and Forensic Pediatrics  
Department of Pediatrics  
University of Florida  
Jacksonville, Florida

---

# CONTENTS IN BRIEF

---

<b>CHAPTER 1: THE CHILD DEATH SPECIALIST . . . . .</b>	<b>1</b>
<b>CHAPTER 2: PERINATAL DEATHS . . . . .</b>	<b>23</b>
<b>CHAPTER 3: SUDDEN UNEXPLAINED INFANT DEATH . . . . .</b>	<b>63</b>
<b>CHAPTER 4: NONABUSIVE INJURIES . . . . .</b>	<b>99</b>
<b>CHAPTER 5: BURN INJURIES. . . . .</b>	<b>121</b>
<b>CHAPTER 6: DROWNING . . . . .</b>	<b>143</b>
<b>CHAPTER 7: PHYSICAL ABUSE . . . . .</b>	<b>161</b>
<b>CHAPTER 8: HOMICIDES . . . . .</b>	<b>205</b>
<b>CHAPTER 9: SUICIDES . . . . .</b>	<b>215</b>
<b>CHAPTER 10: MILITARY APPROACHES . . . . .</b>	<b>223</b>
<b>CHAPTER 11: NEGLECT. . . . .</b>	<b>239</b>



## STM Learning, Inc.

---

### **We've partnered with Copyright Clearance Center to make it easy for you to request permissions to reuse content from STM Learning, Inc.**

---

With [copyright.com](http://copyright.com), you can quickly and easily secure the permissions you want.

Simply follow these steps to get started:

- Visit **copyright.com** and enter the title, ISBN, or ISSN number of the publication you'd like to reuse and hit "Go"
- After finding the title you'd like, choose "Pay-Per-Use Options"
- Enter the publication year of the content you'd like to reuse
- Scroll down the list to find the type of reuse you want to request
- Select the corresponding bubble and click "Price & Order"
- Fill out any required information and follow the prompts to acquire the proper permissions to reuse the content that you'd like

For questions about using the service on **copyright.com**, please contact:



Copyright Clearance Center  
222 Rosewood Drive  
Danvers, MA 01923  
Phone: +1-(978) 750-8400  
Fax: +1-(978) 750-4470

Additional requests can be sent directly to [info@copyright.com](mailto:info@copyright.com).

#### *About Copyright Clearance Center*

*Copyright Clearance Center (CCC), the rights licensing expert, is a global rights broker for the world's most sought-after books, journals, blogs, movies, and more. Founded in 1978 as a not-for-profit organization, CCC provides smart solutions that simplify the access and licensing of content that lets businesses and academic institutions quickly get permission to share copyright-protected materials, while compensating publishers and creators for the use of their works. We make copyright work. For more information, visit [www.copyright.com](http://www.copyright.com).*



---

# CONTENTS IN DETAIL

---

<b>CHAPTER 1: THE CHILD DEATH SPECIALIST</b> . . . . .	1
Conducting an Infant Death Scene Investigation . . . . .	2
Investigating and Re-Creating an Infant Death Scene: Unsafe Sleep. . . . .	2
Describing the Infant Death Scene . . . . .	3
Sleep-Related Deaths . . . . .	5
References . . . . .	22
<b>CHAPTER 2: PERINATAL DEATHS</b> . . . . .	23
Pregnancy- or Placenta-Related Conditions . . . . .	25
Abdominal Trauma to Mother . . . . .	26
Delivery-Related Conditions. . . . .	28
Umbilical Cord Abnormalities . . . . .	30
Perivillous Fibrinoid Deposition . . . . .	32
Infectious Diseases . . . . .	33
Congenital Candidal Infection. . . . .	33
Chorioamnionitis . . . . .	34
Herpes Simplex Virus . . . . .	36
Cytomegalovirus . . . . .	38
Group B Streptococcal Infection. . . . .	39
Congenital Malformations . . . . .	40
Turner Syndrome . . . . .	42
Potter Sequence . . . . .	44
Pulmonary Atresia . . . . .	46
Autosomal Recessive Polycystic Kidney Disease . . . . .	46
Cystic Fibrosis . . . . .	48
Incidental Congenital Malformation. . . . .	50
Maternal Disorders . . . . .	51
Diabetes . . . . .	51
Other System Disorders . . . . .	52
Osteogenesis Imperfecta Type III . . . . .	52
Trauma . . . . .	54
Stabbing . . . . .	56
Probable Asphyxia . . . . .	58
Gunshot Wound. . . . .	60
Undetermined. . . . .	61
Reference . . . . .	62

<b>CHAPTER 3: SUDDEN UNEXPLAINED INFANT DEATH . . .</b>	<b>63</b>
Evaluation of Sudden Infant Deaths. . . . .	63
Death Certification . . . . .	65
Definitive Cause of Death. . . . .	66
Congenital Condition . . . . .	66
Dandy-Walker Cyst. . . . .	70
Dehydration From Congenital Renal Insufficiency. . . . .	71
Toxicological. . . . .	72
Intracranial Hemorrhage With Manner Unknown. . . . .	73
Metabolic Abnormality . . . . .	75
Cause of Death Established by Stressor . . . . .	75
Asphyxia by Sofa Cushion . . . . .	75
Asphyxia by Wedging . . . . .	76
Asphyxia/Strangulation by Curtain Cord . . . . .	77
Findings Unrelated to Cause of Death. . . . .	78
Pierre-Robin Syndrome and Bed Sharing . . . . .	78
Limb Anomalies and Crib Sharing. . . . .	80
Ureteral Duplication and Bed Sharing. . . . .	82
Meckles Diverticulum . . . . .	84
Remote Skeletal Trauma . . . . .	84
Cause of Death Not Established by Stressor. . . . .	86
Bed Sharing . . . . .	86
Cosleeping on Sofa. . . . .	86
Cosleeping on Sofa and Poor Living Environment. . . . .	87
Excessive Bedding . . . . .	89
Possible but Unproven Mechanical Asphyxiation . . . . .	89
Acetaminophen Administration . . . . .	90
Parental Smoking . . . . .	90
Parental Drinking . . . . .	91
Classic Sudden Infant Death Syndrome. . . . .	91
Original Scene No Longer Intact . . . . .	91
Incidental Intrathoracic Petechiae . . . . .	92
Preexisting Noncontributory Medical Condition . . . . .	94
Incidental Fluid Secretions. . . . .	96
No Incidental Findings . . . . .	97
Cause Undetermined but Inconsistent . . . . .	
With Sudden Infant Death Syndrome . . . . .	98
<b>CHAPTER 4: NONABUSIVE INJURIES . . . . .</b>	<b>99</b>
Falls . . . . .	101
From Bicycle. . . . .	101
From Bed . . . . .	104
Death Caused by Craniocerebral Trauma. . . . .	104
Death Caused by Asphyxiation. . . . .	106
Nonfatal . . . . .	107

Accidental Hanging . . . . .	108
Accidental Electrocution . . . . .	109
Natural Death. . . . .	110
Undetermined Cause and Manner of Death. . . . .	112
Cause and Manner of Death Reclassified as Undetermined . . . . .	117
<b>CHAPTER 5: BURN INJURIES . . . . .</b>	<b>121</b>
Injury Investigation . . . . .	123
Abusive Burn Injuries . . . . .	128
Gasoline Ignition Flame Burn . . . . .	128
Dry Contact . . . . .	128
Metal Grating . . . . .	128
Cigarette Burn . . . . .	129
Heated Air Burn . . . . .	129
Hot Liquid Burn. . . . .	130
Splashed/Thrown. . . . .	130
Immersion . . . . .	133
Electrical Burn . . . . .	138
Hot Liquid Burn. . . . .	138
Spilled . . . . .	138
Flowing. . . . .	138
Immersion . . . . .	139
References . . . . .	140
<b>CHAPTER 6: DROWNING . . . . .</b>	<b>143</b>
Death Review . . . . .	145
Prevention. . . . .	147
Negligence . . . . .	150
Additional Suspected Abuse . . . . .	151
Suspected Homicide. . . . .	156
References . . . . .	158
<b>CHAPTER 7: PHYSICAL ABUSE . . . . .</b>	<b>161</b>
Abusive Head Injuries . . . . .	163
Acceleration-Deceleration . . . . .	163
With Impact . . . . .	163
With Multiple Injuries. . . . .	168
Thrown Down Stairs . . . . .	170
Initially Undiagnosed . . . . .	174
Blunt Force Trauma . . . . .	176
Thoracoabdominal Injuries . . . . .	179
Chest Compression . . . . .	179
Blunt Force Trauma . . . . .	180
Stomach Laceration . . . . .	182
Splenic Laceration . . . . .	186

Liver Laceration . . . . .	190
Blunt Abdominal and Soft Tissue Trauma . . . . .	198
<b>CHAPTER 8: HOMICIDES . . . . .</b>	<b>205</b>
Asphyxiation . . . . .	206
Suffocation. . . . .	206
Asphyxiation by Wrapping. . . . .	207
Asphyxiation by Neck Compression . . . . .	208
Strangulation . . . . .	210
Newborn Homicide. . . . .	210
Gunshot Death . . . . .	212
Blunt Force Trauma . . . . .	214
<b>CHAPTER 9: SUICIDES . . . . .</b>	<b>215</b>
Hanging. . . . .	216
Gunshot Wound . . . . .	219
Carbon Monoxide Inhalation . . . . .	220
Fall From Height With Traumatic Injuries . . . . .	221
Reference . . . . .	222
<b>CHAPTER 10: MILITARY APPROACHES . . . . .</b>	<b>223</b>
Infant Left in Car . . . . .	224
Smothering . . . . .	226
Shaken Infant Syndrome . . . . .	228
Physical Abuse. . . . .	230
<b>CHAPTER 11: NEGLECT. . . . .</b>	<b>239</b>
Supervisory Neglect . . . . .	240
Environmental Neglect . . . . .	248
Medical Neglect. . . . .	256
Nutritional Neglect . . . . .	262
References. . . . .	276



---

# Child Abuse

---

## *Pocket Atlas Series*

*Volume Five*

### *Child Fatality and Neglect*



**STM Learning, Inc.**

---

*Leading Publisher of Scientific, Technical, and Medical Educational Resources*

Saint Louis

[www.stmlearning.com](http://www.stmlearning.com)

# THE CHILD DEATH SPECIALIST

Kathleen Diebold, MA

---

In 1991, Missouri initiated a comprehensive child fatality review program designed to establish more accurate determinations of child deaths and to develop a database providing ongoing surveillance of all childhood fatalities. The program has evolved and adapted to meet new challenges throughout the years; however, the objectives have remained the same: to identify potentially fatal risks to infants and children and to respond with multilevel prevention strategies.<sup>1</sup> Missouri's child fatality review program has been used as a model by other states.

Missouri legislation requires that every county in Missouri establish a multidisciplinary panel to examine the deaths of all children younger than 18 years.<sup>2</sup> Every infant aged 1 week to 1 year who dies in a sudden, unexplained manner must have an autopsy.<sup>1</sup> As a result of this initiative, the need for a child death specialist arose. The complexity of infant death scene investigations, coupled with the rapidly growing knowledge base needed to adequately understand child deaths, created the need for child death specialists in smaller medical examiner jurisdictions that can only employ part-time death investigators who are extensively trained in all areas of child deaths. Larger medical examiner offices employ full-time investigators who have the opportunity to accrue the necessary experience required to become skilled in all areas of child death investigations.

Without an extensive circumstantial *and* scene investigation in addition to an autopsy, a meaningful cause and manner of death may be impossible to determine. Experts who specialize in infant death investigations (ie, child death specialists) can assimilate the rapidly increasing amount of information in this area as well as conduct complex death scene investigations, which are necessary to adequately understand infant deaths.

## **CONDUCTING AN INFANT DEATH SCENE INVESTIGATION**

When conducting an investigation, the child death specialist should neither automatically assume nor overlook the possibility of criminality or negligence. Investigators should assume an empathetic, nonconfrontational approach, which is both appropriate and effective.

In addition to interviewing witnesses, child death specialists may work in tandem with prosecutors, emergency medical services (EMS) personnel, juvenile officers, medical examiners/coroners, law enforcement officers, public health providers and/or physicians, and department of family services workers when investigating a case. Often, EMS personnel, law enforcement officers, fire department officials, and the medical examiner investigator work together to process the scene and determine what happened when the child died. By contacting the family's pediatrician, the investigator can ascertain whether the pediatrician had any red flags with regard to the child's care, welfare, or family dynamics and can obtain a better understanding of the child's overall health as well as any medical issues or complications. The child's entire medical record and birth chart should be obtained from the pediatrician and birth hospital. The pediatrician can also provide information about whether the child has ever been seen at local hospitals after birth. A call to the department of family services hotline can provide information regarding prior reports on the family, siblings, or other individuals living in the residence.

## **INVESTIGATING AND RE-CREATING AN INFANT DEATH SCENE: UNSAFE SLEEP**

When an infant dies suddenly and unexpectedly during sleep, a thorough understanding of the death scene is necessary to accurately determine the cause and manner of death. The re-creation of the infant death scene is a critical element in determining both the cause and manner of death. The diagnosis of sudden infant death syndrome (SIDS) should not be automatically assumed. Many people do not realize the hazards of unsafe sleeping and may not realize a pillow could suffocate an infant. They may not be capable of accurately describing the scene verbally; therefore, the re-creation of the death scene provides the investigator a visual representation of the infant's sleep position. Child death specialists do not need to perform scene re-creations of sleeping positions of toddlers or older children because they are developmentally capable of righting themselves if they accidentally roll over.

There are potentially 2 individuals who have firsthand knowledge of the sleep positions: the individual who placed the infant down to sleep (the “placer”) and the individual who found the infant unresponsive (the “finder”). Both positions, which could be the same if the infant did not move after being placed down to sleep, are of interest and need to be documented with photographs.

The re-creation is a highly emotional task and is performed after all interviews are completed. The re-creation starts with the child death specialist explaining to the parents or caregivers why it is necessary and the importance of using the doll as an investigative tool to document the exact sleep environment. The child death specialist demonstrates the articulation of the doll’s arms, legs, and head. The doll is handed to the placer who is asked to demonstrate the exact position of the infant when placed down to sleep. The placer is asked to verify and recreate the sleeping environment using any pillows, blankets, toys, or other materials that were used and to demonstrate if the infant was cosleeping or bed sharing with another individual. This position is then photographed. The finder is asked to perform the same task, demonstrating the infant’s environment when found. The re-creation serves as the “picture” of the infant death scene, much like a photograph of an adult death scene.

Prior to leaving the scene, the child death specialist should debrief family members and provide them with the office policy and a timeline for release of reports, a contact name and telephone number for them to call if they have further questions, and information on SIDS resources.

The following are important tips to remember:

- A death scene investigation is always necessary when an infant dies, even if the infant is transported to a hospital.
- Recreating the scene with the use of a re-creation doll is a critical part of the investigation.
- Document both the placed and found positions.
- To ensure that the scene is accurately recreated, the individuals who actually witnessed the scene (placer and finder) should always be the ones to recreate the scene.

## **DESCRIBING THE INFANT DEATH SCENE**

During an infant death scene investigation, an accurate description of the infant’s sleeping environment and the identification of the infant’s placed and found positions are critical. A written narrative with a thorough, accurate account of all information obtained at the



infant death scene will need to be completed, and the following are important details that should be noted by the child death specialist:

- Body position of the infant, with particular attention to the position of the nose and mouth, eg, facedown on surface, face up, face right, face left, any items obstructing nose/mouth, wedged
- Bedding and/or other objects located near the infant, eg, bumper pads, pillows, blankets, positional supports, stuffed animals, toys, family pets
- Whether the infant was cosleeping/bed sharing, eg, sleeping in the same room or sleeping in the same bed
- Type of surface on which the infant was sleeping, eg, sofa/couch, adult bed [mattress], water bed, crib, bassinet, car seat, floor
- Social history of caregiver(s), family, infant, siblings, and other individuals living in the residence
- Pregnancy history of mother, eg, prenatal care, gestation, complications during pregnancy or delivery, trauma during pregnancy, number of pregnancies and live births, prescription medications, alcohol, cigarettes, illicit drugs, herbal remedies
- Events surrounding the death, eg, changes in the infant's behavior or medications, new foods introduced in the past 72 hours, witnesses of the death, status of infant when found, resuscitation attempts, EMS involvement, movement to medical facility
- Condition of the infant, eg, hygiene, nourishment, clothing clean and of appropriate size and season, diaper used, birthmarks or visible injuries, livor mortis, rigor mortis, body temperature
- Environmental conditions, eg, presence of insects, smoky smell [cigarettes], dampness, visible standing water, mold growth, pets, peeling paint, odors or fumes, alcohol containers, drug paraphernalia
- Checklist for the discretionary collection of evidence, eg, clothing, bedding, diapers, medicines, baby bottles, formula/food, honey, toys, equipment, drug paraphernalia, folk remedies
- Details of all witnesses, responders, and other persons at scene, eg, name, address, phone number, relationship

## SLEEP-RELATED DEATHS

### Case Study 1-1

This 8-week-old boy and his 2-year-old sibling were in the care of their paternal grandfather and his girlfriend. The children had been dropped off for the weekend the previous evening around 10:00 PM. The infant was given half of a bottle between 10:30 and 11:00 PM. At approximately 1:00 AM the infant and his sibling were placed down to sleep on top of a comforter on a full-sized bed located against the wall in the spare bedroom. The sibling was sleeping on the inside of the bed near the wall. The infant was placed down on his right side. A row of pillows was placed around the outside of the bed in an attempt to keep the infant from falling out of bed.

The grandfather, his girlfriend, and the 2 year old woke up at 8:00 AM. The girlfriend walked into the bedroom to check on the infant. She found the infant in a prone position, with his nose and mouth faced into the comforter. She turned him over and found him blue, cold to the touch, and unresponsive. EMS was called. The grandfather performed cardiopulmonary resuscitation (CPR) as instructed by EMS. The infant was pronounced dead upon EMS arrival at 8:35 AM.

The infant was born with medical complications, including bilateral clubfeet, missing ribs, a hole in his heart, a closed right ear canal, absent left testis, and left intestine bulging out of his left side. All of these were confirmed during autopsy, and a thin, old, left occipital subdural membrane was found. The cause of death was suffocation, and the manner of death was accident.

**Figure 1-1-a.** Scene re-creation of the placed position.

**Figures 1-1-b and c.** Scene re-creation of the found position.



**Figure 1-1-a**



**Figure 1-1-b**



**Figure 1-1-c**

## SLEEP-RELATED DEATHS

### Case Study 1-2

The mother of this 3-month-old boy placed him in his crib around 11:30 PM. The crib was next to the mother's bed. Around 2:00 AM the mother woke up to the infant crying. She picked him up, changed his diaper, and fed him a bottle. She brought him into her full-sized bed along with his crib blanket and a small crib-sized comforter. He was placed in a prone position in the middle of her bed. The mother woke up around 8:30 AM and found the infant still lying prone, with his face and nose down into the bedding. Froth was coming out of his nose and mouth, he appeared grayish, and he was unresponsive. EMS was called, and the mother attempted CPR as instructed by EMS until personnel arrived. The infant was pronounced dead at the scene.



Figure 1-2-a

The mother's bed had a fitted sheet, the infant's crib comforter, and another full-sized comforter on the bed. There were 2 standard-sized pillows at the head of the bed. Also on the bed were a white cloth, a baby bib, and a small suitcase that was open and contained a pile of clothing and a teddy bear. There was a baby bottle with formula between the comforter and the suitcase. Secretion was noted on the bed where the infant was found facedown.

Autopsy findings included petechial hemorrhages of the epicardium, thymus, and lungs; frothy fluid from the nose; and moderate acute chronic inflammation of the laryngeal mucosa. The cause of death was suffocation, and the manner of death was accidental.

**Figure 1-2-a.** Bed showing blood-tinged secretion spot.

**Figure 1-2-b.** Scene re-creation of the placed position.



Figure 1-2-b

# INDEX

---

## A

- abdominal injuries, 162
- abdominal trauma, 26, 27, 188
- abuse, physical. *See* physical abuse
- abusive burn injuries
  - cigarette burn, 129
  - gasoline ignition flame burn, 128
  - heated air burn, 129
  - hot liquid burn, 130–137
  - metal grating, 128
- abusive contact burns, 121
- abusive head injuries, 166–178
  - acceleration-deceleration. *See* acceleration-deceleration
  - blunt force trauma, 176–178
  - initially undiagnosed, 174–175
  - mild degrees of, 161
  - with multiple injuries, 168
- abusive scalds, 122
- acceleration-deceleration
  - forces, 101
  - injuries, 100, 120
  - movement of head, 161
- accidental bathtub drowning, 143
- accidental contacts, 121
- accidental electrocution, 109
- accidental hanging, 108
- accidental immersion scalds, 122
- accidental splenic lacerations, 162
- acetaminophen administration, 90
- adequate supervision, 143
  - guidelines for, 145
- adolescents, 145
- adult respiratory distress syndrome, 121
- AFCCP. *See* Armed Forces Center for Child Protection (AFCCP)
- AFIP. *See* Armed Forces Institute of Pathology (AFIP)
- AFOSI. *See* Air Force Office of Special Investigations (AFOSI)
- Air Force Office of Special Investigations (AFOSI), 228
- alcoholism, 174
- anoxic encephalopathy, 228
- Armed Forces Center for Child Protection (AFCCP), 228
- Armed Forces Institute of Pathology (AFIP), 228
- ARPKD. *See* autosomal recessive polycystic kidney disease (ARPKD)
- asphyxia, 16, 19, 20, 205
  - by curtain cord, 77
  - by sofa cushion, 75
  - by wedging, 76
- asphyxiation, 206
  - death caused by, 106
  - by neck compression, 208–209
  - strangulation, 210
  - suffocation, 206
  - by wrapping, 207
- autosomal recessive polycystic kidney disease (ARPKD), 46–47
- axonal processes in brain, 161

## B

- BAPP. *See* beta-amyloid precursor protein (BAPP)
- basilar subdural hemorrhage, 74
- basin's fill rate, 123
- bathtub near-drownings, 247
- beta-amyloid precursor protein (BAPP), 117
  - staining for, 120
- bilateral papilledema, 132
- bilateral pneumonia, 269

- bilateral retinal hemorrhages, 151
  - bleeding of lacerated organs, 162
  - blood loss, 161, 162, 188, 192
  - blunt force trauma, 180–181, 214
  - body surface area (BSA) injury, 134
  - bradycardia, 132
  - brain
    - abnormality, 66
    - axonal processes in, 161
  - bronchiectasis, 48
  - BSA injury. *See* body surface area (BSA) injury
  - burn injuries
    - abusive and nonabusive, 124
    - abusive burn injuries
      - cigarette burn, 129
      - gasoline ignition flame burn, 128
      - heated air burn, 129
      - hot liquid burn, 130–137
      - metal grating, 128
    - causes of, 121
    - nonabusive burn injuries
      - electrical burn, 138
      - hot liquid burn, 138–139
  - burn-related cardiac dysfunction, 121
  - C**
    - carboked medication, 72
    - carbon monoxide inhalation, 220
    - cardiopulmonary resuscitation (CPR), 5, 104, 106, 148, 179
    - caustic burns, 122
    - cerebral palsy, 270
    - chemical burns, 122
    - chest compression, 179, 181
    - child abusive head injuries, 101
    - child and adolescent suicide review team (CASRT), 215
    - child death specialist, death scene investigation, 2–3
    - child fall, 264. *See also* falls
    - child fatality review program, 1
    - child maltreatment, form of, 239
    - child neglect, 121
    - childproof latches on hot tubs, 147, 149
    - child protective services (CPS), 66, 122, 145
  - children
    - mild illnesses in, 161
    - safety, 240
    - unattended in cars, 240
  - chorioamnionitis, 34–35
  - cigarette burn, 129
  - Clark's study, 122
  - classic sudden infant death syndrome
    - fluid secretions, 96
    - intrathoracic petechiae, 92–93
    - noncontributory medical condition, 94–95
  - coagulative burns, 122
  - congenital anomaly, 68
  - congenital candidal infection, 33
  - congenital malformations, 25, 40–50
    - autosomal recessive polycystic kidney disease, 46–47
    - cystic fibrosis, 48–49
    - incidental congenital malformation, 50
    - Potter sequence, 44–45
    - pulmonary atresia, 46
    - Turner syndrome, 42–43
  - congenital renal insufficiency, dehydration from, 71
  - contact burns, 121
  - contrecoup contusions, 99, 102
  - County Child and Adolescent Suicide Review Team (CASRT), 215
  - covers on hot tubs, 147, 149
  - CPR. *See* cardiopulmonary resuscitation (CPR)
  - CPS. *See* child protective services (CPS)
  - craniocerebral trauma, 102, 104–105, 112, 154, 164
  - cyanosis, 75
  - cystic fibrosis, 48–49
  - cytomegalovirus (CMV) infection, 38
- D**
    - Dandy-Walker cyst, 70
    - death
      - acetaminophen administration, 90
      - asphyxia by sofa cushion, 75

- asphyxia by wedging, 76  
 asphyxia/strangulation by  
     curtain cord, 77  
 bed sharing, 86  
 in children, drowning, 143  
 cosleeping on sofa, 86  
 excessive bedding, 89  
 incidental fluid secretions, 96  
 intrathoracic petechiae, 92  
 mechanical asphyxiation, 89  
 parental drinking, 91  
 parental smoking, 90  
 poor living environment, 87–88  
 scene investigation, 3, 64, 87  
 strangulation, 77  
 undetermined, 98, 112–120  
 death certification, 65  
     for congenital nervous system  
         condition, 67  
     for ephedrine overdose, 72  
     for incidental remote skeletal  
         trauma, 85  
     for intracranial hemorrhage, 74  
     for Pierre-Robin Syndrome, 79  
 death, definitive cause of, 66–75  
     congenital condition, 66–69  
     Dandy-Walker cyst, 70–71  
     dehydration from congenital  
         renal insufficiency, 71  
     intracranial hemorrhage, 73–74  
     metabolic abnormality, 75  
     toxicology, 72  
 death of child, military case, 223  
     infant left in car, 224–225  
     physical abuse, 230–238  
     shaken infant syndrome,  
         228–229  
     smothering, 226–227  
 death, unrelated findings  
     limb anomalies and crib  
         sharing, 80–81  
     meckles diverticulum, 84  
     Pierre-Robin syndrome/bed  
         sharing, 78–79  
     remote skeletal trauma, 84–85  
     ureteral duplication and bed  
         sharing, 82–83  
 delayed mortality, 121  
 dental neglect, 239  
 diabetes, 51  
 diarrhea, 268–269  
 diffuse hypoxic injury, 101  
 diffuse subdural bleeding, 100  
 Division of Family Services, 256  
 drowning, 143  
     in bathtub, 242  
     death review of, 145–147  
     hazard for toddlers, 143–144  
     intoxication of, 143  
     negligence, 150–155  
     prevention of, 146–149  
     risk of, 143–145  
     suspected homicide, 156–157
- E**
- ecchymosis, 256  
 edema in lungs, 13, 15, 16  
 electrical burn, 138  
 electrical injuries, 122  
 electric thermostats, 124  
 emergency medical services (EMS),  
     2, 106, 111, 132, 272  
 EMS. *See* emergency medical  
     services (EMS)  
 energy, radiant sources of, 122  
 environmental hazards, 250  
 environmental neglect, 239,  
     248–255  
 epicardial petechiae, 92  
 epidural hematoma, 104  
 epidural hemorrhage, 100  
 external stressor, 65
- F**
- facial bruising, 128  
 fainter bruising, 130  
 falls  
     from bed, 104–106  
     from bicycle, 101–103  
     from height with traumatic  
         injuries, 221–222  
     nonfatal, 107  
 family advocacy program (FAP), 224  
 fatal battered child syndrome, 121  
 fatal burn injuries, 121  
 feeding, 270  
 flame burns, 121, 128  
 food, 272

fractures, 99. *See also* specific fractures  
of multiple ribs, 162  
frontal bruising, 151

## G

gasoline ignition flame burn, 128  
gastroesophageal reflux disease, 14  
gastroesophageal reflux treatment, 262  
grid burn scar, 128  
group B streptococcal infection, 39  
gunshot death, 212–213  
gunshot wound, 60, 219

## H

hanging, 216–218  
accidental, 108  
head injuries, 99, 101  
prevention of, 102  
heated air burn, 129  
hematocrit, levels of, 161  
hemoglobin, levels of, 161  
hemorrhages, 100  
hemotympanum, 130  
herpes simplex virus (HSV), 36–37  
Hight's criteria, 122  
home falls, 99  
homicides, 117  
asphyxiation, 206–210  
blunt force trauma, 214  
defined, 205  
gunshot death, 212–213  
newborn, 210–211  
suspected, 156–157  
hot liquid burn, 130–139  
flowing, 138  
immersion, 139  
spilled, 138  
HSV. *See* herpes simplex virus (HSV)  
hypopigmented scar, 95, 224  
hypotension, 132  
hypoxic encephalopathy, 111

## I

immersion burn, 134–137  
immersion scald patterns, 126  
inadequate supervision, 143  
infant death scene

description of, 3–4  
diagnosis of, 2  
investigation, 2–3  
re-creation of, 2–3  
infant left in car, 224–225  
infectious diseases  
chorioamnionitis, 34–35  
congenital candidal infection, 33  
cytomegalovirus, 38  
group B streptococcal infection, 39  
herpes simplex virus, 36–37  
ingestions, 242  
injuries  
abdominal, 162  
abusive burn. *See* abusive burn injuries  
abusive head. *See* abusive head injuries  
acceleration-deceleration, 100  
burn. *See* burn injuries  
child abusive head, 101  
diffuse hypoxic, 101  
electrical, 122  
fatal burn, 121  
head, 99, 101  
nonabusive. *See* nonabusive injuries  
thoracoabdominal. *See* thoracoabdominal injuries  
voltage, 122  
intentional drowning, common scenarios for, 145  
intoxication of drowning, 143  
intracranial bleeding, 107  
intracranial hemorrhage, 73–74, 119  
intrathoracic petechiae, 92  
ischemic lesions, 120

## L

lacerations  
of liver, 162  
of spleen, 162  
of stomach, 162  
life jackets, 147, 148  
ligature strangulation, 77  
limb anomalies, 80–81  
liver laceration, 190–197

**M**

magnetic resonance imaging (MRI), 161  
malnutrition, 266, 269  
  evidence of, 270  
maternal diabetes, 51  
maternal disorders, 51  
mechanical asphyxiation, 89  
meckles diverticulum, 84  
meconium ileus, 48  
medical care, 121  
medical neglect, 239, 256–261  
medication, application of, 256  
metal grating, 128  
microscopic examination, 63  
mild illnesses in children, common  
  symptoms of, 161  
monilial rash, 256  
morbidity  
  cause of, 239  
  prevention of, 239  
mortality  
  cause of, 239  
  delayed, 121  
  prevention of, 239  
MRI. *See* magnetic resonance  
  imaging (MRI)  
myoclonic jerking, 176

**N**

National Child Abuse and Neglect  
  Data System  
  (NCANDS), 239  
natural death, 110–111  
nausea, 162  
naval criminal investigative services  
  (NCIS), 224  
neck compression, 208–209  
necrotic cerebellar tonsils, 120  
necrotizing fasciitis, 257  
neglect  
  description of, 239  
  determination of, 145  
  environmental, 248–255  
  forms of, 239  
  of hygiene, 255  
  medical, 256–261  
  nutritional, 262–275  
  severity of, 271  
  supervisory, 240–247

negligence, 150–155  
  preventability and, 121  
newborn homicide, 210–211  
nonabusive burn injuries  
  electrical burn, 138  
  hot liquid burn, 138–139  
nonabusive injuries  
  accidental electrocution, 109  
  accidental hanging, 108  
  description of, 99  
  falls, 101–107  
  head injuries, 99  
  natural death, 110–111  
  undetermined cause and manner  
  of death, 112–120  
nonaccidental trauma (NAT), 239  
nurturing, basic needs for, 263  
nutritional neglect, 239, 262–275  
  conditions of, 270–272

**O**

occipital skull fracture, 246  
ornamental ponds, 144

**P**

papilledema, 152  
parental drinking, 91  
parental smoking, 90  
patterned scars, 121  
perinatal death  
  congenital malformations,  
  40–50  
  infectious diseases, 33–39  
  maternal disorders, 51  
  and neonatal stages, 23  
  pregnancy/placenta-related  
  complications, 23–32  
  system disorders, 52–53  
  trauma, 54–60  
  undetermined, 61–62  
petechial hemorrhages, 6, 15, 21  
physical abuse, 110, 230–238, 266  
  evidence of, 264  
  head injuries, 161  
  during pregnancy, 27  
physical therapy, 267  
Pierre-Robin Syndrome, 78–79  
play therapy, 267  
pneumonia, 260



- postburn fatalities, 121
- posturing, 118
- poter sequence, 44–45
- pregnancy/placenta-related complications
  - abdominal trauma to mother, 26–27
  - delivery-related conditions, 28–29
  - perivillous fibrinoid deposition, 32
  - umbilical cord abnormalities, 30–31
- premature child, 264
- premature delivery, 27
- probable asphyxia, 58–59
- pulmonary atresia, 46
- pulmonary congestion, 92
- R**
  - radiant sources of energy, 122
  - rehydration, 268
  - remote rib fractures, 84
  - remote skeletal trauma, 84
  - resuscitation, 156
  - retinal hemorrhage, 100, 118, 120, 132, 264–265
  - retropharyngeal abscess, 260
  - rib, 162
    - fractures, 162
- S**
  - scalds, 121–122
    - abusive and accidental immersion, 122
  - scalp, bruises on, 99, 116
  - sepsis, 258
  - sexual abuse, 239
  - shaken infant syndrome, 228–229
  - short falls, numerous studies of, 99–101
  - SIDS. *See* sudden infant death syndrome (SIDS)
  - skull fractures, prevention of, 102
  - sleep-related deaths, 5–22
  - smothering, 226–227
  - social stressor, 80
  - sphenoid sinus, 101
  - splenic laceration, 186–189
  - stabbing, 56–57
  - steam burns, 122
  - stomach laceration, 162, 182–185
  - strangulation, 210
  - streptococcal pharyngitis, 260
  - subacute mortality, 121
  - subarachnoid blood, 161
  - subarachnoid hemorrhage, 73, 112, 114, 120, 161
  - subcutaneous fat, 265
  - subdural blood, thin layers of, 161
  - subdural hemorrhage (SDH), 120, 152, 161
  - subendocardial fibrosis, 110
  - subgaleal bleeding, 151
  - subgaleal hemorrhage, 119, 175
  - sudden infant deaths
    - certification, 65
    - classic sudden infant death syndrome, 91–97
    - components involved in, 64
    - definitive cause of death, 66–75
    - description of, 63
    - established by stressor, cause of, 75–77
    - evaluation of, 63–34
    - findings, unrelated to death, 78–85
    - not established by stressor, cause of, 86–91
    - undetermined, 98
  - sudden infant death syndrome (SIDS), 2, 63
  - suffocation, 206
  - suicide
    - carbon monoxide inhalation, 220
    - defined, 215
    - fall from height with traumatic injuries, 221–222
    - gunshot wound, 219
    - hanging, 216–218
  - sunburns, 122
  - superficial infection, 136
  - superficial myocardium, 110
  - supervisory neglect, 239, 240–247
  - suspected abuse, 151–155
  - system disorders, osteogenesis imperfecta type III, 52–53

**T**

- temporal subgaleal hemorrhage, 105
- temporary foster care placement, 263
- tentorium cerebelli, 101
- thoracoabdominal injuries, 162
  - blunt abdominal and soft tissue trauma, 198–204
  - blunt force trauma, 180–181
  - chest compression, 179
  - liver laceration, 190–197
  - splenic laceration, 186–189
  - stomach laceration, 182–185
- thymic petechiae, 93
- toddlers, 143
  - drownings, 143
- trauma, 54–60
  - gunshot wound, 60
  - probable asphyxia, 58–59
  - stabbing, 56–57
- traumatic asphyxiation, 243
- traumatic diffuse axonal injury, 161
- traumatic subarachnoid hemorrhage, 100
- traumatic subdural hemorrhage, 100
- Turner syndrome, 42

**U**

- UCMJ. *See* Uniform Code of Military Justice (UCMJ)
- Uniform Code of Military Justice (UCMJ), 225
- unintentional drowning, 143
- unsafe sleep, 2–3
- ureteral duplication, 82
- US Flammable Fabrics Act, 122

**V**

- visceral pleural petechiae, 92
- voltage injuries, 123

**W**

- water–scalded children, 122
- widespread subdural bleeding, 100
- wrapping, 207