

FORENSIC PATHOLOGY: THE FORENSIC AUTOPSY

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Pathology, Forensic Pathology, & Autopsy

- **Pathology** is a medical specialty *originally* designed to study the structural and morphological changes to the body as a result of a disease state
- **Forensic Pathology** is a medical specialty designed to determine the cause and manner of death in cases of suspicious or unexplained death
- **Autopsy** is a post mortem examination performed on a corpse to determine the cause and manner of death. The word autopsy comes from the Greek word *autopsía*, which translates to “seeing with one’s own eyes”.

Duties of Forensic Pathologist

- Determine apparent cause of death
- Determine or estimate postmortem interval of death (PMI)
- Ascertain manner of death (homicide, suicide, accidental, natural, or unknown)
- Determine identity of deceased



Forensic Pathologists

- Must have a medical degree
- Performs 4 year residency in pathology
- Spends additional year in residency and apply for certification through American Board of Pathology

Medical Examiners vs. Coroners

- Crowners of England (1000 BC): predecessors of coroners
- About ½ of U.S. uses a coroner system
 - Coroner is usually elected
 - Do not normally possess formal education
 - May be funeral home director
 - Minority of states coroner must be a physician
- Medical Examiner system used in other states
 - must be a physician
 - usually appointed

The Real CSI: Death Detective Dysfunction

- [NPR: Coroner System](#)
- [NPR: Medical Examiner](#)



Manners of Death

- **Homicidal Death**

- The term 'homicide' refers to the act of taking a human life.
- Homicide is the most investigated death & therefore the most autopsied.

- **Natural Causes**

- Term used to describe death by normal disease process
- Majority of natural death is caused by old age
- Others: heart disease, stroke, genetic disorders, etc.

- **Accidental**

- Death caused mistake or in a freak occurrence
- Not planned yet can be explained by surrounding circumstances

- **Suicide**

- The act of ending ones own life
- Cause can be of toxic nature, firearms, blunt force trauma, etc.

- **Unknown (undetermined)**

- May include deaths in absentia: deaths at sea, missing persons, etc.

Medicolegal Autopsy

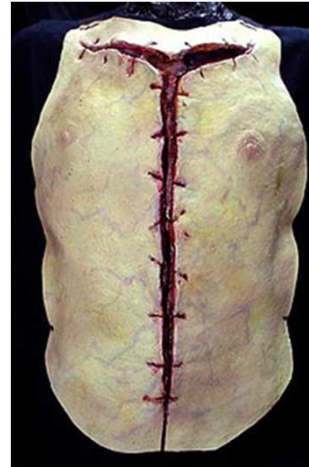
- Certain religions limit when autopsies can be performed
- Generally kin of deceased must give permission for autopsy
- Medicolegal Autopsies make up about 1/3 of all autopsies
- Exceptions occur due to state laws
 - Sudden, unexpected death
 - Violent death
 - Unattended or suspicious death
- Medicolegal Autopsies make up about 1/3 of all autopsies

Autopsy Process

- External Examination
 - detailed examination of entire body is made and all wounds and trauma are noted
 - body is photographed clothed and unclothed
 - physical evidence collected off body
 - samples of hair, nails, etc. are collected
 - remove clothing and body is photographed unclothed
 - examine for wounds unclothed
 - note scars, tattoos or other unusual body markings including lacerations, abrasions, bruises.



Autopsy Process



- **Internal Examination**

- Incisions to torso are made and internal examinations done
 - A “Y” shaped cut from behind each ear and running down the neck, meeting at the breastbone, continuing towards the groin
- body fluid samples taken, major organs removed and weighed, and assessment of wounds done.
- external objects that may have caused death are removed
- X-rays may be taken.

Autopsy Process: Videos

- [How Autopsies Work--Dr. G](#)
- [Graphic Autopsy](#)

Estimating Postmortem Interval

- Use established guidelines for Algor, Livor & Rigor Mortis
- Other conditions that may affect these timelines
 - Temperature
 - Environment
 - Degree of protection-clothing, body being covered
 - Land vs. water

Estimating PMI (Post Mortem Interval)

Algor Mortis

- Post mortem cooling 1°C / hour
- At normal temps (37°C) take ~ 1 day for body to cool
- Conditions surrounding body can affect cooling
- Use algor mortis for estimating PMI if the death took place within 12 hours of discovery

Taking temp of liver.
Why the liver?

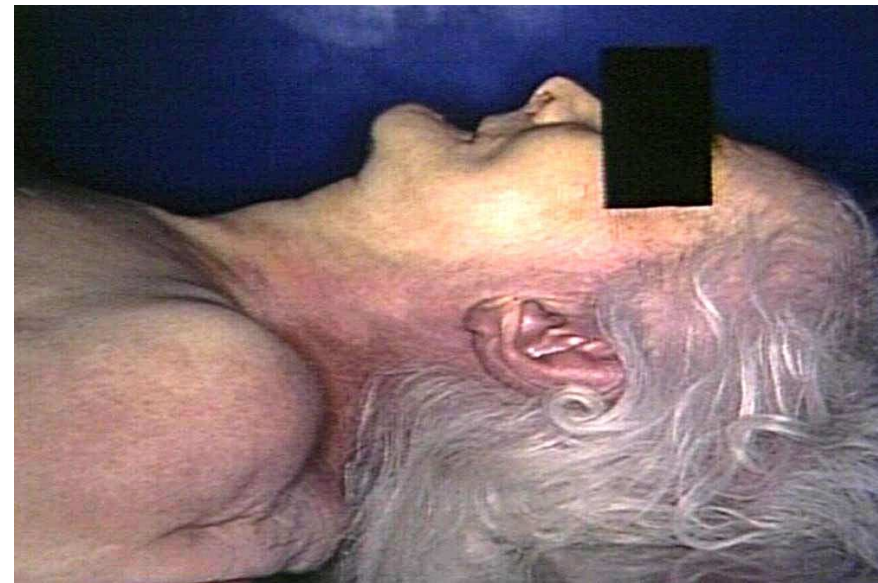


Estimating PMI (Post Mortem Interval)

- **Livor Mortis**

- Upon death blood ceases to circulate
- Blood pools at lowest part of body due to gravity
- Upper parts of body become pale
- Livor mortis is disrupted by body resting on floor where pressure prevents blood pooling
- Onset is as soon as 30 minutes after death
- After several hours, livor mortis is fixed
- Area of livor mortis changes from red to green to brown

Livor Mortis



Estimating PMI (Post Mortem Interval)

Rigor Mortis

- Upon death the joints and muscles relax
- 2-5 hours latter muscles contract and joints stiffen
- Process is complete 12-24 hours after death
- 2-3 days later rigor mortis disappears
- Rigor mortis is accelerated by heat and strenuous physical activity before death



Other Methods of Estimating PMI

- Chemical levels may be related to PMI
- Potassium levels in eye fluid (vitreous humor—the more potassium, the longer the victim has been dead)
- Metabolite in brain
- Film over eye is related to PMI
- Stomach contents may be used to estimate PMI, as it takes 2-4 hours to digest meal
- Stomach emptying may only be used as a corroborative test

Late PMI

- After 1-2 days past death, certain activities take place
- Decomposition of a corpse begins soon after death and may be evident within 2-3 days
- Body becomes discolored with skin turning green near abdomen and hips
- Bloat ensues
- High temperatures accelerate decomposition



Desiccation of a body

Autopsy Activities

- Initial Autopsy: Autopsy of the Dill Pickle
- Autopsy of a Fetal Pig “Victim”

Our First Autopsy: The Dill Pickle



- Set up one week prior
- Sam's Club
- Day before prepare the victims
 - Broken limbs
 - Cuts
 - Stab wounds
 - Bullet holes
 - Burns
 - External scars/tatoos



The Autopsy



Fetal Pig Autopsy



Blogging Using Trade Books

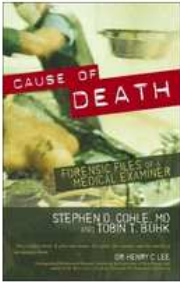
Sections to Blogs:

- Setting the Stage
- Forensic Science Vocabulary
- Investigative Evidence
- Passage Selection
- Sell the Book!
- Reflection


Tuesday, February 5, 2013

Setting the Stage

Part One:
I am reading Cause of Death: Forensic Files of A Medical Examiner by Stephen D. Cohle, MD and Tobin T. Buhk. Stephen Cohle is the narrator of the story and is a medical examiner in Grand Rapids which does make him an expert. My expectations of this book are to learn more about the life of a medical examiner and the process of autopsy. I am very interested in digging deeper into the forensic pathology and medical examining. I hoping that my knowledge will develop because of reading this book and so far my interest has definitely been won.







Part Two:
All of this story takes place in Grand Rapids, MI so in other words, right down the highway from us! The everyday setting for Cohle is in the Kent County Morgue located in Spectrum Health Hospital. This is his place of work as the medical examiner. I believe that Cohle's purpose for writing this book is to show people the real life, down and dirty, job of a forensic pathologist outside of the Hollywood drama that people grow accustomed to on TV. He shares his duties in hope of informing his readers of the danger and the disgusting of his everyday life.



Blog Archive

- ▼ 2013 (7)
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 - [Nice background. Now work on getting the Setting ...](#)
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Contributors

-  [K. Mirakovits](#)
-  [Shannon](#)
-  [Mrs. Walker](#)
-  [Alison](#)

Instructors and Students Comment on The Blogs

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Part Three:


The main character of the book is the narrator, Stephen Cohle. He is the medical examiner and forensic pathologist. The other character who is also very important is Tobin Buhk. He is a school teacher who wanted to get an inside look on his friends job and possibly join the field someday. Cohle so far has helped me understand the story the most because he is the one in there and doing it. He step by step explains the procedures and the feelings and the thoughts behind being surrounded by the dead constantly. Cause of Death is enlightening to say the least, its a perspective that you don't get to see everyday.


Posted by Alison at 9:01 AM

Recommend this on Google

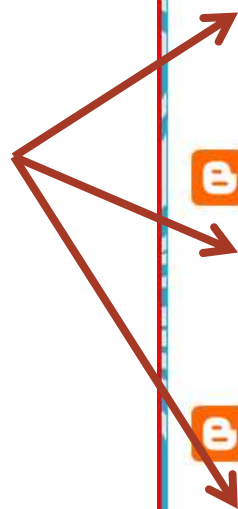
3 comments:

 Mrs. Walker February 22, 2013 at 4:48 PM
Very engaging introduction to your book! How great that Mrs. Mirakovits knows this author and his experience comes from practicing in Grand Rapids, Michigan.
[Reply](#)

 K. Mirakovits February 26, 2013 at 4:56 PM
Thank you, Mrs. Walker. I agree that you did an engaging introduction. Have you blogged to your partner about what you expect in reading this book. Do you think you will recognize any of the cases? I do not remember when it was published.
[Reply](#) [Delete](#)

 Shannon February 27, 2013 at 3:47 PM
I have read it and I agree with Alison where she said that his book is very informational. I plan to learn a massive amount from this book!

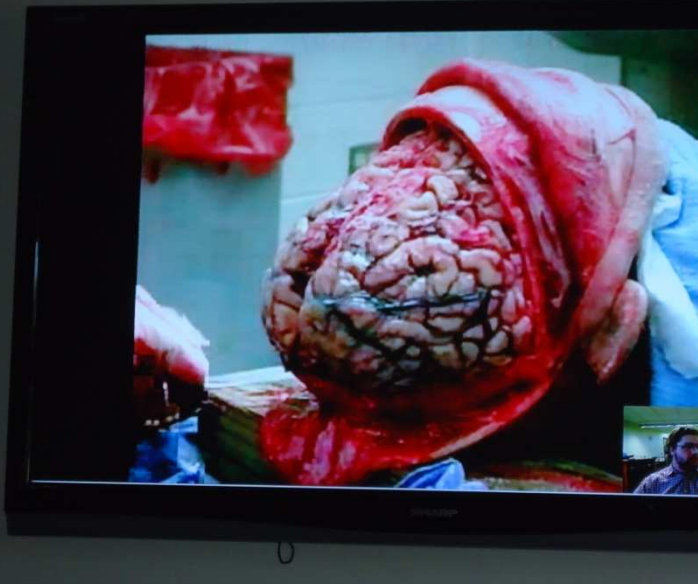
Comments



Autopsy Activities

- COSI: Center of Science and Industry, Columbus, Ohio
 - [COSI: In Depth--Autopsy](#)
 - <http://www.cosi.org/downloads/ivc/ProgramDetails-Autopsy.pdf>
- PBS Frontline DVD: Post Mortem
<http://video.pbs.org/video/1774485437>

COSI: April 2012



The End—Thank You!

Presentation (PDF) will be available (soon) at my website:
www.forensicscience-ed.com

Or email me for a copy

