Overview

- Purpose of it all
- Brief history of death investigation in US
  - Coroner, Medical Examiner, Forensic Pathologist
  - Death investigation systems
  - Arizona death investigation
- Statistics – Cause & Manner of Death
- Interaction with LE
- Examples

Purpose of the Medical Examiner’s Office

- Determines cause and manner of death of decedents that fall under jurisdiction of ME
- Types of deaths that require reporting
  - Death when not under current care of a physician
  - Violence
  - Sudden and unexpected
  - Threat to public health
  - Prisoner or in a prison
  - Suspicious, unusual, unnatural
  - Related to occupation
  - Related to medical procedure
  - Unidentified

Purpose of the Medical Examiner’s Office

- Public health
  - Report deaths due to communicable disease
  - Authorize cremation
  - Tissue and organ donation
  - Vital statistics
- Assist families
  - Answer questions
  - Timely death certification for funeral arrangements

Purpose of the Medical Examiner’s Office

- Aid justice system
  - Collect evidence
  - Testify
  - Interpret injury
  - Estimate postmortem interval

What’s The Difference?

- Coroner
- Medical Examiner
- Forensic Pathologist
**Coroner**
- Often elected, term limit
- Qualification specified by local law
- May not have any medical background
- Concept from England
- Minimal practical modern use

**Medical Examiner**
- Often appointed by government without term limit
- Often a physician (can be any kind)
- May be appointed non-physician
- May not be a Forensic Pathologist

**Forensic Pathologist**
- Physician (pathologist)
- Additional training in forensics
- Work in larger population centers
- Criminal case work and testimony

**Arizona**
- 9 Counties in Arizona run a Forensic Pathologist managed death investigation system
- Medical Examiner = Forensic Pathologist
- Alternate Medical Examiner = Non-FP physician
- No coroners in Arizona, only ME’s and alternate ME’s
Total Cases 2004 - 2013

Cause vs Manner of Death

- Cause
  - Blunt force injury
  - Coronary artery disease
  - Diabetes
  - Hanging
  - Gunshot wound
  - Overdose
  - Emphysema
  - etc

- Manner
  - Homicide
  - Suicide
  - Natural
  - Accident
  - Undetermined

MANNER OF DEATH - 2013

Homicide by Cause - 2013

- Firearms - 25%
- Sharp Force - 15%
- Blunt Force - 15%
- Other - 8%

Accident by Cause - 2013

- Overdose - 34%
- Blunt Force Trauma - 27%
- Motor Vehicle Accident - 23%
- Exposures - 8%
- Drowning - 3%
- Asphyxia - 2%
- Fire Deaths - 2%
- Other - 2%

Suicide by Cause - 2013

- Firearms - 53%
- Hanging - 27%
- Overdose - 12%
- Asphyxia - 3%
- Other - 4%
Natural Deaths by Cause - 2013

Cardiovascular Disease - 64%
Sequelae of Chronic Alcohol Abuse - 8%
Pulmonary Disease - 6%
Infectious Disease - 5%
Diabetes Mellitus - 4%
Malignancy - 4%
Other - 9%

Overdose Deaths 2010 - 2013

Select Drugs by Year 2011-2013

Oxycodone
Morphine
Alcohol
Methamphetamine
Heroin
Cocaine

ME and the Judicial System

Frequently consulted in criminal prosecution and civil litigation
Most criminal investigations involve homicides followed by accidents (MVA)
Most commonly called to testify by the prosecution as neutral expert witness
Guilt is determined by the court

What information we provide

Estimate postmortem interval
Document and characterize injury
- Firearms, Sharp force, Blunt force, Asphyxia, etc
Presence/absence of natural disease or other conditions
Survivability
Distinguish between artifact and injury
Collect evidence

Components of Examination

Review of information
- Scene, demographic, medical history, comments from law enforcement, families, others
External Examination
- Clothing, height, weight, injuries, natural disease, scars, tattoos, medical intervention, evidence collection
Internal Examination
- Injuries, natural disease, medical intervention, evidence collection
Components of Examination

- Toxicology
  - Illicit drugs, prescription medications, poisons
- Radiographs
  - Projectiles, dental examination for ID, hardware
- Histology
  - Infections, cancer, natural disease
- Other
  - Cultures, DNA, special tests

Postmortem Interval

- Rigor Mortis
- Livor Mortis
- Algor Mortis
- Amount of decomposition
- VERY environmentally dependent
- Last seen alive
- Mail, paper, cell phone, etc

Postmortem Change Questions

- Are the finding consistent with story “X”?
- Postmortem movement of the body?
- Environment – temperature, air flow, clothing, body habitus, humidity, insect activity, animal scavenging

GSW Questions

- Range of fire?
  - Contact
  - Intermediate
  - Distant
- Entrance/Exit?
- If multiple injuries which is most serious?
- Same weapon?
- Handgun, shotgun, rifle, etc?

Sharp Force Injury Questions

- Stab or incised wound?
- Length of blade?
- Depth of penetration?
- If multiple wounds which is most serious?
- Direction of wound?
- Sharp or blunt edges?
- Consistent with weapon “X”?

Blunt Force Injury Questions

- Contusion, abrasion or laceration?
- All injuries same age?
- If multiple which is most serious?
- Consistent with being produced by weapon “X”?
- Pattern to injury?
Natural Death Questions
- Often involve sudden deaths or deaths of individuals who did not see a doctor
- How did they die?
- Could I have done something sooner?
- Does this run in the family?

CHARGE Syndrome
- Coloboma of the eye
- Heart defects
- Atresia of the choanae
- Retardation of growth or development
- Genital/urinary abnormalities
- Ear abnormalities or deafness