



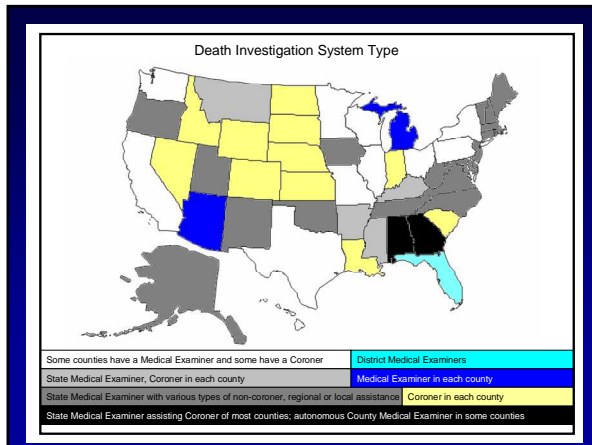
## Death Certification for Clinicians

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## Coroner vs. Medical Examiner

- Citizen
- No specified training
- Administrator or Law enforcement
- Elected or appointed
- Physician
- Usually forensic board certified
- Public health
- Usually appointed



## CALIFORNIA: 58 Counties

- 47 Sheriff-Coroner
- 7 Coroner
- 1 ME-Coroner (Los Angeles)
- 3 ME (San Diego, San Francisco, Ventura)

## Board Certified Forensic Pathologists Certified by American Board of Pathology

- After:
  - 4 years medical school
  - 3-4 years residency
  - 1 year fellowship
- Must pass Anatomic Pathology exam before eligible to take Forensic Pathology exam
- 350-450 board certified practicing in US

## REPORTABLE DEATHS

Defined by CA H&S Code 10250  
and Gov Code 27491

- Violent, sudden, or unusual.
- Unattended by physician in last 20 days.
- Related to accident or injury, either old or recent.
- Homicide, suicide, or accidental.
- Due to criminal acts.

## DEATH CERTIFICATION

### Reporting Requirements

- The ME/C must be notified for those types of death specified in CA Gov Code 27491.
- The only requirement is for the ME/C to investigate.
- The ME/Coroner has a right to the medical record, and can have it subpoenaed (HIPAA exempt).
- Permission of next of kin NOT required for ME/C autopsy.
- The physician must be able to certify natural cause before allowing a hospital autopsy.

## Reporting Requirements

- The physician signing the death certificate should report the death to the OCME.
- If you are not the primary physician, or know very little about the patient short of what is in the medical chart, you should not be signing the death certificate.
- Failing to report a death or inaccurately reporting the death is a misdemeanor, and you could also be held liable in potential civil litigation!

## California Gov. Code 27491

- Known or suspected homicide.
- Known or suspected suicide.
- Accident: Whether the primary cause or only contributory; whether the accident occurred immediately or at some remote time.
- Injury: Whether the primary cause or only contributory; whether the injury occurred immediately or at some remote time.

## California Gov. Code 27491

- Grounds to suspect that the death occurred in any degree from a criminal act.
- No physician in attendance (no medical history).
- Wherein the deceased has not been attended by a physician in the 20 days prior to death ("in attendance" is defined as "the existence of the relationship whereby a health care provider renders those services which are authorized by the health care provider's licensure or certification.")
- Wherein the physician is unable to state the cause of death (must be genuinely unable and not merely unwilling.)

## California Gov. Code 27491

- Poisoning (food, chemical, drug, therapeutic agents).
- All deaths due to occupational disease or injury.
- All deaths in operating rooms or following surgery or a major medical procedure.
- All deaths where a patient has not fully recovered from an anesthetic, whether in surgery, recovery room or elsewhere.

## California Gov. Code 27491

- All solitary deaths. (Unattended by a physician, family member or any other responsible person in the period preceding death.)
- All deaths in which the patient is comatose throughout the period of physician's attendance, whether in home or hospital.
- All deaths of unidentified persons.
- All deaths where the suspected cause of death is Sudden Infant Death Syndrome (SIDS).

## California Gov. Code 27491

- All deaths in prisons, jails, or of persons under the control of a law enforcement agency.
- All deaths of patients in state mental hospitals.
- All deaths where there is no known next-of-kin.
- All deaths caused by a known or suspected contagious disease constituting a public health hazard, to include AIDS.
- All deaths due to acute alcohol or drug intoxication.

## Typical CA Death Certificate

Death reported to ME: YES/NO

LEGAL STANDARD: REASONABLE MEDICAL CERTAINTY

107A	Cause of death
107B	<b>DUE TO</b> Cause of death
107C	<b>DUE TO</b> Cause of death
107D	<b>DUE TO</b> <i>Underlying</i> Cause of death
112	Other significant conditions contributing to death <i>but not causing 107A</i> (above)
113	Medical /Surgical Procedures (Dates)

## Degrees of Certainty

- Beyond a Reasonable Doubt:
  - Standard for conviction in criminal case
- Clear and Convincing evidence:
  - Standard for death certificate for Suicide
- Preponderance of the Evidence/Balance of the Probabilities, Probable:
  - Standard for death certificate for most cases
  - Standard for most civil litigation
  - Probable cause: standard for arrest, search, indictment
- Reasonable Possibility:
  - Standard for investigative stop or brief search
- Possible, Guess, Speculation: Not admissible

## Degrees of Certainty

- Beyond any Doubt 100%
- Beyond a Reasonable doubt >99%
- Clear and Convincing evidence >70%
- Preponderance of the Evidence/Balance of the Probabilities, Probable >50%
- Reasonable Possibility, <50%
- Possible, Guess, Speculation >0%

## Cause of Death

The *etiologically specific disease or injury* which *starts* the lethal sequence of events *without sufficient intervening causes*.

## Mechanism of Death

A description of the *physiologic derangement (set in motion by the cause of death)*

that results in the cessation of:

*the pumping of the heart  
breathing*

*cellular energy metabolism.*



## Manner of Death

- **Natural:** Due predominantly to disease or aging
- **Accident:** Unforeseeable acts or hostile environment
- **Homicide:** Death at the hand of another
- **Suicide:** From self-destructive act – need *clear and convincing evidence*
- **Pending**
- **Cannot be Determined**

## Therapeutic Complications

- Must be reported: Natural or *Accident*?
- Need to know:
  - Dates of procedures.
  - Indications for procedures.
  - Co-morbidities and risk factors (including abnormal anatomy that made the complication more likely).
  - Is this an expected or common complication of this procedure? (complications listed on consent form are not necessarily either!)

## Good Natural Causes of Death

- Atherosclerotic cardiovascular disease.
- Myocardial infarct due to HASCVD.
- Hypertensive stroke.
- Ruptured cerebral aneurysm.
- Chronic alcoholism.
- Complications of diabetes mellitus.
- Infectious complications of chronic substance abuse.

## NOT GOOD AT ALL!

- Cardiorespiratory arrest
- Cardiac arrhythmia
- Respiratory failure
- End stage liver /kidney disease
- Pneumonia
- Multi-organ system failure
- Sepsis
- Cerebral palsy
- Cerebrovascular Accident

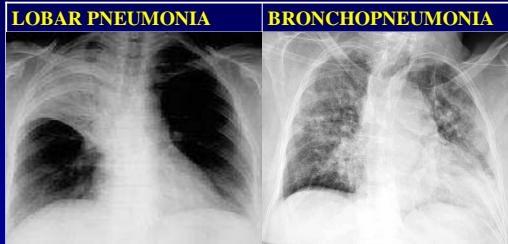
## BETTER!

- Cardiac arrhythmia **DUE TO** Rheumatic valve disease
- Respiratory failure **DUE TO** asthma/COPD
- ESLD **DUE TO** Chronic alcoholism
- ESRD **DUE TO** Diabetes/HCVd
- *Pneumonia – Lobar or Bronchopneumonia?*
- *Sepsis – Due to what?*
- *Cerebral Palsy – Garbage bag diagnosis!*
- *Cerebrovascular Accident – stroke is better, but still DUE TO what?*

## Pneumonia

	LOBAR PNEUMONIA	BRONCHOPNEUMONIA
Patient	Healthy	Debilitated
X-ray	Single lobe	Bilateral fluffy or “aspiration pattern”
Cause	Viral/Bacterial	Usually bacterial
DC	Can stand alone	Must be <b>DUE TO</b> something

## Pneumonia



## Pneumonia



## Debilitated

- Dementia:
  - Alzheimer's
  - Parkinson's
  - Multi-infarct
- Stroke:
  - Ischemic: ASCVD
  - Hemorrhagic: Hypertension, drugs (coke, meth)
- Trauma
- Chronic disease: Diabetes, Alcoholism, COPD...

## Sepsis

- Definition: overwhelming infection
  - Hypotension (low blood pressure)
  - Elevated white cell count
  - Organisms in the blood when cultured
- More common in debilitated patients.
- Must be DUE TO something:
  - The name of the bacterial organism isn't enough
  - Source of the infection: respiratory (pneumonia), urinary tract (UTI), intestinal (gastroenteritis), wound...

## Urinary Tract Infection

- Sometimes termed "Urosepsis"
- More common in debilitated persons
- May be due to an indwelling catheter
  - Needs to be stated on DC
  - Reason for the catheter is important:
    - Prostate cancer: Natural
    - Paraplegia from a gunshot wound: Homicide



## Cerebral Palsy



- "Garbage Bag" diagnosis
- AKA: Little's disease, *spastic diplegia*
- Refers to a number of neurological disorders that appear in infancy or early childhood and permanently affect body movement and muscle coordination but aren't progressive.
- 1980's National Institute of Neurological Disorders and Stroke (NINDS) analyzed data from > 35,000 newborns and their mothers, and discovered that complications during birth and labor accounted for only a fraction (<10%) of the infants born with cerebral palsy.
- Most cases, they could find no single, obvious cause.

## Seizures

- Type of seizure:
  - Grand mal – loss of consciousness, jerky movements
  - Petit mal or absence – “zones out”
- Inciting event (trauma?), withdrawal, or idiopathic epilepsy (usually from childhood)
- Medications: dosage, compliance
- Last time had a seizure

## Evaluating Remote Injuries

- First you gotta ask!
- Did the injury compromise this person’s baseline?
  - Immobility: they never walked again.
  - Debility: they became a vegetable.
  - It was a downhill course from their injury until their death.
- It’s a judgment call!

## Cases

- Read the medical information and then:
  - Circle YES if you think this case needs to be reported under the law. Circle NO if not.
  - Write the Cause of Death on lines 107A-D.
  - Remember A is *Due To* B, which is *Due To* C etc...
  - You don’t have to fill in all the lines, just 107A.
  - Line 112 is for all other medical conditions.
  - *Cardiopulmonary arrest* is not allowed!!! (It is a description of death, not a cause of death).

## Case 1

- A 56 year old male with Hepatitis C and end stage liver disease presents with an upper GI bleed.
- Upper endoscopy is performed but he exsanguinates despite repeated attempts to stop the variceal hemorrhage.
- He is Utox- and the cause of the HCV is remote IVDA.

## Case 1: Death Certificate

Death reported to ME: **YES**

107A	Upper GI bleed	hours
107B	End Stage Liver Disease	months
107C	Hepatitis C	years
107D	(Chronic IV Drug abuse)	years
112		
113	Upper GI endoscopy (Date)	

## Case 2

- A 65 year old male with Hepatitis C and end stage liver disease presents with ascites and sepsis.
- A liver biopsy is performed but the next day his Hct drops and a CT reveals intra-abdominal hemorrhage.
- He is Utox- and the only risk factor for HCV is a remote transfusion that occurred during resection of a renal tumor, years ago.

### Case 2: Death Certificate

Death reported to ME: **YES**

107A	Hemorrhagic complications of cirrhosis (status post liver biopsy)	hours
107B	Hepatitis C virus	years
107C		
107D		
112		
113	Liver biopsy (Date)	

### Case 2: Death Certificate

Death reported to ME: **YES**

107A	Hemorrhagic complications of cirrhosis (status post liver biopsy)	hours
107B	Hepatitis C virus	years
107C	Infected blood products	years
107D	Nephrectomy for renal mass	years
112		
113	Liver biopsy (Date)	

### Case 3

- An 85 year old man with a h/o diabetes mellitus, s/p remote MI is in a nursing home with dementia.
- He develops bronchopneumonia, is put on comfort measures only and dies, attended by family.

### Case 3: Death Certificate

Death reported to ME: **NO**

107A	Bronchopneumonia	days
107B	Dementia (clinical)	years
107C		
107D		
112	Diabetes mellitus, ASCVD	
113		

### Case 3: Death Certificate

Death reported to ME: **NO**

107A	Bronchopneumonia	days
107B	Alzheimer's Dementia	years
107C		
107D		
112	Diabetes mellitus, ASCVD	
113		

### Case 4

- An 62 year old man with a 20 pack year history of smoking and a history of chronic alcoholism c/o a fever and cough.
- In the ER a CXR shows bilateral fluffy infiltrates and sputum culture is positive for *Klebsiella*.
- He becomes hypoxic and dies 2 days later, despite antibiotic therapy.

### Case 4: Death Certificate

Death reported to ME: **NO**

107A	Bronchopneumonia	days
107B	COPD	years
107C		
107D		
112	Chronic alcoholism	
113		

### Case 4: Death Certificate

Death reported to ME: **NO**

107A	Bronchopneumonia	days
107B	Chronic alcoholism	years
107C		
107D		
112	COPD	
113		

### Case 5

- An 40 year old woman with a remote history of smoking develops a hacking productive cough and fever one winter following an outbreak of Influenza.
- She is admitted to the ER and a CXR shows a lobar RLL infiltrate.
- She is admitted but becomes hypoxic and dies within 24 hours of admission.

### Case 5: Death Certificate

Death reported to ME: **YES**

107A	Lobar pneumonia	days
107B	Probable viral etiology	days
107C		
107D		
112		
113		

### Case 6

- A 33 year old man with cerebral palsy who has been in a state institution since childhood has a recurrent history of pneumonia and recurrent UTI's.
- He dies of multi-organ system failure from sepsis.
- Blood and urine cultures are both positive for *E. coli*.

### Case 6: Death Certificate

Death reported to ME: **YES**

107A	<i>E. coli</i> Sepsis	days
107B	Urinary tract infection (catheter-related)	days
107C	Anoxic ischemic brain injury	years
107D	Intrauterine hypoxia	years
112		
113		



## Case 6: Death Certificate

Death reported to ME: **YES**

107A	<i>E. coli</i> Sepsis	days
107B	Urinary tract infection (catheter-related)	days
107C	Down's Syndrome	years
107D		
112		
113		

## Case 6: Death Certificate

Death reported to ME: **YES**

107A	<i>E. coli</i> Sepsis	days
107B	Urinary tract infection (catheter-related)	days
107C	Anoxic ischemic brain injury	years
107D	Obstetric complication during delivery	years
112		
113		

**Accident!**

## Case 6: Death Certificate

Death reported to ME: **YES**

107A	<i>E. coli</i> Sepsis	days
107B	Urinary tract infection (catheter-related)	days
107C	Anoxic ischemic brain injury	years
107D	Shaken Baby Syndrome	years
112		
113		

**HOMICIDE!**

## Case 7

- A baby girl dies in the NICU after 2 weeks of life.
- She was born to a G2 P1 mother with a history of pre-term labor, pre-eclampsia and gestational diabetes.
- The infant is born at 26 weeks, develops NEC, has an interventricular hemorrhage and subsequently dies with MOSF.

## Case 7: Death Certificate

Death reported to ME: **NO**

107A	Complications of prematurity	weeks
107B		
107C		
107D		
112		
113		

## Case 7 (again)

- A baby girl dies in the NICU after 2 weeks of life.
- She was born to a G2 P1 mother with a history of pre-term labor, pre-eclampsia and gestational diabetes.
- The infant is born at 26 weeks, develops NEC, has an interventricular hemorrhage and subsequently dies with MOSF.
- Pathology on placenta reveals chorioamnionitis.

## Case 7: Death Certificate

Death reported to ME: **NO**

107A	Complications of prematurity	weeks
107B	Chorioamnionitis	weeks
107C		
107D		
112		
113		

## Case 8

- A baby girl dies in the NICU after 2 weeks of life.
- She was born to a G2 P1 mother with a history of drug abuse (cocaine and heroin).
- The infant is born at 26 weeks, develops NEC, has an interventricular hemorrhage and subsequently dies with MOSF.
- Mom's tox is positive on admission and infant is treated for symptoms of withdrawal.

## Case 8: Death Certificate

Death reported to ME: **YES**

107A	Complications of prematurity	weeks
107B	Maternal drug abuse.	weeks
107C		
107D		
112		
113		

**Accident?**

## Case 9

- A baby girl dies in the NICU after 2 weeks of life.
- She was born to a G2 P1 mother with a history of domestic violence.
- The infant is born at 26 weeks, develops NEC, has an interventricular hemorrhage and subsequently dies with MOSF.
- Mom has bruises on her belly and arm. She tells nursing staff that she "fell" into a door shortly before going into pre-term labor.

## Case 9: Death Certificate

Death reported to ME: **YES**

107A	Complications of prematurity	weeks
107B	Blunt trauma of abdomen.	weeks
107C		
107D		
112		
113		

**Homicide?**

## Case 10

- A 4 month old boy is brought to the ER in respiratory arrest.
- He was found unresponsive in his crib at a child care center about 30 minutes after being fed and put down for a nap.
- He has no significant medical history.
- After resuscitation he survives 3 weeks in the PICU before being declared brain dead.

## Case 10: Death Certificate

Death reported to ME: **YES**

107A	SIDS? Abusive head injury?	weeks
107B		
107C		
107D		
112		
113		

## Case 11

- A 55 year old man with familial hypercholesterolemia and type II DM dies at home. You've been his doc for years.
- He had a CABG x 3 two years ago, and had been c/o edema, increasing angina and SOB.
- His wife found him dead in bed in the a.m.
- You saw him last week, so you are asked to sign the death certificate.

## Case 11: Death Certificate

Death reported to ME: **YES**

107A	Congestive heart failure	weeks
107B	Atherosclerotic Coronary Artery Disease	years
107C		
107D		
112	Hypercholesterolemia, DM	
113	Bypass grafts (date)	

## Case 12

- A 55 year old man with familial hypercholesterolemia and type II DM dies at home. You've been his doc for years.
- He had a CABG x 3 two years ago, and had been c/o edema, increasing angina and SOB.
- His wife found him dead in the garage, where he was working on a household improvement project.

## Case 12: Death Certificate

Death reported to ME: **YES**

107A	ASCVD? Electrocution? CO poisoning?	
107B		
107C		
107D		
112		
113		

**Accident?**

## Case 12 (again)

- A 55 year old man with familial hypercholesterolemia and type II DM dies at home. You've been his doc for years.
- He had a CABG x 3 two years ago, and had been c/o edema, increasing angina and SOB.
- His wife found him dead in the back yard hot tub.

## Case 12: Death Certificate

Death reported to ME: **YES**

107A	ASCVD? Electrocutation? Drowning?	
107B		
107C		
107D		
112		
113	<b>Accident?</b>	

## Case 13

- A 55 year old man with primary sclerosing cholangitis and cirrhosis undergoes a liver transplant.
- He dies of acute rejection and sepsis 2 weeks after surgery.

## Case 13: Death Certificate

Death reported to ME: **NO**

107A	Acute rejection.	days
107B	Liver transplant.	weeks
107C	Primary sclerosing cholangitis.	years
107D		
112	Infectious complications of immunosuppression.	
113	Liver transplant (date), ERCP (date)	

## Case 14

- A 22 year old woman with a history of depression develops jaundice and fulminant hepatic failure 3 days after taking too much Tylenol.
- She undergoes a liver transplant, survives 3 years, but eventually succumbs to chronic rejection.

## Case 14: Death Certificate

Death reported to ME: **YES**

107A	Chronic rejection	years
107B	Liver transplant	years
107C	Fulminant hepatic failure	years
107D	Acetaminophen intoxication	years
112		
113	Liver transplant (date) <b>Suicide!</b>	

## Case 15

- A 30 year old man is stabbed in the abdomen in a bar brawl.
- The knife damages the hepatic artery and by the time he is resuscitated he has suffered irreversible hepatic injury.
- He undergoes a liver transplant, but after 13 months he stops taking his meds and dies from acute rejection.

## Case 15: Death Certificate

Death reported to ME: **YES**

107A	Acute rejection	months
107B	Liver transplant	months
107C	Hepatic artery injury	months
107D	Stab wound of abdomen	months
112		
113	Liver transplant (date)	

**HOMICIDE!**

## Case 16

- A 45 year old woman with longstanding hypertension c/o a headache, then has a witnessed collapse.
- In the ER a CT scan shows no impact site or fracture. There is no intraparenchymal hemorrhage, but there is SAH at the base of the brain.
- She dies before angiography can be performed.

## Case 16: Death Certificate

Death reported to ME: **YES**

107A	Subarachnoid hemorrhage	hours
107B	<i>Probable</i> ruptured aneurysm	hours
107C		
107D		
112	Hypertension	
113		

## Case 17

- A 65 year old man with diabetes, heart disease, congestive heart failure and COPD is admitted with chest pain.
- Coronary angiography shows high grade stenosis, but he is a poor surgical candidate.
- Two days after angiography he develops ST segment elevations, + troponins and dies.
- The family is livid because the “doctors killed him.”

## Case 17: Death Certificate

Death reported to ME: **YES**

107A	Myocardial infarct	hours
107B	Atherosclerotic Coronary Artery Disease	years
107C		
107D		
112	COPD, Diabetes mellitus	
113	Coronary angiography (date)	

## Death Certification for Medical Examiners

Dr. Judy Melinek  
Assistant Medical Examiner  
San Francisco

## Manner of Death: Natural

- Due solely or predominantly to disease or aging.
- This does not exempt reporting of suspected neglect, especially in an elderly person.
- This does not exempt omission of any recent or remote injuries. The decision of whether the injury is contributory or not is that of the Medical Examiner. The time interval is of little relevance to Manner determination.

## Manner of Death: Accident

- Due to an unforeseeable injury.
- “Were it not but for the injury or hostile environment, would the person have died at that moment?”
- Injuries: falls, motor vehicle collisions, drowning, aspiration of a food bolus, acute intoxication by medications or drugs, natural disasters (electrocution, hurricane)...
- Hostile environment: MI while swimming, seizure while bathing.
- Insurance: Double indemnity.

## Manner of Death: Suicide

- The only manner in which you need to show intent to within clear and convincing evidence.
  - Suicide note.
  - Hanging: complexity of knots, preparation.
  - Drugs: pills in gastric content, levels that are orders of magnitude above therapy, empty bottles.
  - Jumps: obstacles needed to overcome, planar injury.

## Manner of Death: Homicide

- By definition: *Death at the hand of another.*
- *Intent* is a common element but is not required.
- *Volitional* acts are the key element.
- Does not need to be prosecutable.
- Tricky situations and jurisdictional differences: deaths in custody, “accidental” discharge of firearms by another person, hunting accidents, sports related injuries (boxing), risk-taking behaviors.

## Manner of Death: Undetermined

- Information pointing to one manner of death is no more compelling than other manners of death.
- Usually 1-5% of a forensic practice (NAME).
- Should not be used in lieu of a complete investigation.

## Typical ME Death Certificate

107A	Cause of death	time
107B	<b>DUE TO</b> Cause of death	time
107C	<b>DUE TO</b> Cause of death	time
107D	<b>DUE TO</b> <i>Underlying</i> Cause of death	time
112	Other significant conditions contributing to death <i>but not causing 107A</i> (above)	
113	Medical /Surgical Procedures (Dates)	
Manner: Nat/ Acc/ Hom/ Sui/ Undet.		124. How injury occurred.

## Cases

- Review clinical history, autopsy findings and toxicology.
- Assume that all other tests or procedures are negative.
- Assume that no other information is available, and that complete scene investigations were performed.
- Answers are suggestions based on NAME guidelines, and the conventions of our field.
- Manner determinations may differ by jurisdiction.
- Fill out 124 “How incident occurred” on all non-natural cases.

## Case 1

- A 42 year old man with a history of chronic alcoholism was found dead at home.
- Autopsy disclosed fatty cirrhosis of the liver and his blood contained 0.35% ethanol.

## Case 1: Death Certificate

107A	Acute and chronic alcoholism	years
107B		
107C		
107D		
112		
113		
Manner: Natural		124.

## Case 2

- A 18 year old man drank a quart of vodka in an hour to win a bet at a fraternity party.
- Several hours later he was found dead in a chair.
- Autopsy disclosed visceral congestion and pulmonary edema.
- A blood alcohol analysis contained 0.48% ethanol.

## Case 2: Death Certificate

107A	Acute ethanol intoxication.	hours
107B		
107C		
107D		
112		
113		
Manner: Accident		124. Drank toxic amounts of ethanol

## Case 3

- A 25 year old woman was found dead in the bathroom at home with drug paraphernalia on the sink.
- Autopsy disclosed typical cutaneous and visceral stigmata of IVDA and a fresh needle puncture at the left forearm.
- Toxicology: opiates in blood, urine, bile and brain in lethal concentrations.

### Case 3: Death Certificate

107A	Acute and chronic intravenous drug abuse (opiates).	years
107B		
107C		
107D		
112		
113		
Manner: Accident		124. See above.

### Case 4

- A 55 year old man with no known medical history was found dead at home.
- Autopsy disclosed hemopericardium with tamponade due to a ruptured dissecting aortic aneurysm.
- The heart weighed 620 grams and had a 2.0 cm thick left ventricular wall. The kidneys had moderate arterial and arteriolar nephrosclerosis.

### Case 4: Death Certificate

107A	Hemopericardium with tamponade	minutes
107B	Ruptured dissecting aortic aneurysm	hours
107C	Hypertensive cardiovascular disease	years
107D		
112		
113		
Manner: Natural		124.

### Case 5

- A 40 year old man with AIDS died from PCP pneumonia.
- He had been an intravenous drug abuser for many years and had no other known risk factors for exposure to HIV.

### Case 5: Death Certificate

107A	<i>Pneumocystis carinii</i> pneumonia	days
107B	Acquired Immune Deficiency Syndrome	years
107C	Chronic intravenous drug abuse.	years
107D		
112		
113		
Manner: Natural		124.

### Case 6

- A 40 year old man with AIDS died from PCP pneumonia.
- He was homosexual and had no other known risk factors for exposure to HIV.



### Case 6: Death Certificate

107A	<i>Pneumocystis carinii</i> pneumonia	days
107B	Acquired Immune Deficiency Syndrome	years
107C		
107D		
112		
113		
Manner: Natural		124.

### Case 7

- A 40 year old hemophiliac with AIDS died from PCP pneumonia.
- He had been the recipient of clotting factors and multiple blood transfusions since early childhood.

### Case 7: Death Certificate

107A	<i>Pneumocystis carinii</i> pneumonia	days
107B	Acquired Immune Deficiency Syndrome	years
107C	Receipt of HIV contaminated blood products	years
107D	Treatment of Hemophilia A	years
112		
113		
Manner: Natural.		124.

### Case 8

- A 40 year old man with AIDS died from PCP pneumonia.
- In 1981 he was the victim of an armed robbery and shooting.
- His treatment at that time included multiple blood transfusions.
- He has no other known risk factors for HIV.

### Case 8: Death Certificate

107A	<i>Pneumocystis carinii</i> pneumonia	days
107B	Acquired Immune Deficiency Syndrome	years
107C	Receipt of HIV contaminated blood products	years
107D	Treatment of gunshot wound	years
112		
113		
Manner: Homicide		124. Shot by another

### Case 9

- A 35 year old woman delivered a baby via C-section. Operative blood loss necessitated transfusion with red blood cells.
- Cardiovascular collapse following transfusion lead to her eventual death.
- The patients post-transfusion blood cultures and culture of the unit revealed infection with *Yersinia enterocolitica*.
- Autopsy findings confirmed death from sepsis.

### Case 9: Death Certificate

107A	<i>Yersinia enterocolitica</i> sepsis.	days
107B	Transfusion of contaminated red blood cells	days
107C	Cesarean section of term infant	days
107D		
112		
113		
Manner: Natural		124.

### Case 10

- A 35 year old woman delivered a baby via C-section. Operative blood loss necessitated transfusion with red blood cells.
- Cardiovascular collapse following transfusion lead to her eventual death.
- A transfusion reaction work-up revealed ABO mismatch: in error, she was given type A blood, although she was a type O.

### Case 10: Death Certificate

107A	Complications of ABO incompatible red cell transfusion.	days
107B	Cesarean section of term infant	days
107C		
107D		
112		
113		
Manner: Accident.		124. Transfusion of improperly labeled red cell unit.

### Case 11

- A 65 year old diabetic woman was admitted to the hospital with chronic renal failure and congestive heart failure due to hypertensive cardiovascular disease.
- She was treated with digoxin and diuretics.
- In spite of the therapeutic administration of routine doses, she developed digitalis intoxication and died.

### Case 11: Death Certificate

107A	Digitalis intoxication.	hours
107B	Treatment with Digoxin for Congestive Heart Failure	days
107C	Hypertensive cardiovascular disease	years
107D		
112	Diabetes mellitus with chronic renal failure	
113		
Manner: Natural		124.

### Case 12

- A 65 year old diabetic woman was admitted to the hospital with congestive heart failure due to hypertensive cardiovascular disease and chronic renal failure.
- Her doctor wrote appropriate orders for digoxin and diuretics.
- The nurse misread the doctor's order and administered ten times the prescribed dose.
- The patient developed digitalis intoxication and died.

## Case 12: Death Certificate

107A	Digitalis intoxication.	hours
107B	Overdose of Digoxin during treatment for Congestive Heart Failure	days
107C	Hypertensive cardiovascular disease	years
107D		
112	Diabetes mellitus with chronic renal failure	
113		
Manner: Accident		124. Administered over dosage of appropriately prescribed medication.

## Case 13

- A 72 year old man with degenerative calcific aortic stenosis underwent a valve replacement following successful treatment of a bout of congestive heart failure.
- The operative procedure was uneventful until its conclusion when the patient could not be weaned from the pump.
- Autopsy disclosed an intact prosthetic valve, no mechanical complication of surgery, and a 760 gram heart with a hypertrophied and fibrotic left ventricle.

## Case 13: Death Certificate

107A	Post-operative death following prosthetic replacement of aortic valve	hours
107B	Treatment of degenerative calcific aortic stenosis.	years
107C		
107D		
112		
113	Aortic valve replacement (Date)	
Manner: Natural		124.

## Case 14

- An 80 year old woman with Alzheimer's dementia is in a nursing home when she has sudden onset of shortness of breath while eating.
- She is resuscitated but dies three days later from sepsis complicating aspiration pneumonia.
- Autopsy discloses advanced coronary artery disease, Alzheimer's in the brain and microscopic sections confirm bronchopneumonia.

## Case 14: Death Certificate

107A	Aspiration pneumonia.	days
107B	Alzheimer's disease.	years
107C		
107D		
112	ASCVD.	
113		
Manner: Natural.		124.

## Case 15

- An 80 year old woman with Alzheimer's disease is having a lobster dinner with her husband.
- She is witnessed to choke on the food and when paramedics arrive, they have to remove a 3 cm piece of lobster from her airway before they can intubate.
- She survives 3 days in the hospital before dying of sepsis complicating aspiration pneumonia.

### Case 15: Death Certificate

107A	Aspiration pneumonia	days
107B	Aspiration of food bolus	days
107C		
107D		
112	Alzheimer's disease	
113		
Manner: Accident		124. Choked on lobster.

### Case 16

- A 33 year old man with a history of drug abuse, chronic pain and depression was found hanging from a noose configured from a rope in the closet of his locked house.
- Scene investigation disclosed numerous empty medication bottles.
- There was no suicide note and autopsy disclosed slight decomposition and empty gastric contents.
- The ligature furrow elevated to the back of the head and there were no other signs of trauma.

### Case 16: Death Certificate

107A	Hanging.	minutes
107B		
107C		
107D		
112		
113		
Manner: Suicide.		124. Hanged self with rope.

### Case 17

- A 33 year old man with a history of drug abuse, chronic pain and depression was found dead at home.
- Scene investigation disclosed numerous empty medication bottles.
- There was no suicide note and autopsy disclosed slight decomposition and an empty gastric contents.
- Toxicology revealed lethal levels of opiates and benzodiazepines.

### Case 17: Death Certificate

107A	Acute intoxication due to the combined effects of opiates and benzodiazepines.	hours
107B		
107C		
107D		
112		
113		
Manner: Accident.		124. Took lethal combination of medications.

### Case 18

- A group of adult men were drinking and playing Russian Roulette with one of their service revolvers.
- When one of them is killed they call 911.
- Autopsy discloses a contact gunshot wound of the head and at the scene there is one casing in the revolver.
- GSR is positive for all the players.

### Case 18: Death Certificate

107A	Contact gunshot wound of head	minutes
107B		
107C		
107D		
112		
113		
Manner: Suicide		124. Shot self playing "Russian Roulette"

### Case 19

- A 83 year old homeless alcoholic was found floating in a river.
- He lived at a homeless encampment near the river, which floods in the winter.
- Autopsy disclosed heavy, edematous lungs, fluid in the frontal sinus and moderate decomposition changes.
- Toxicology was positive for 0.25 gm/dl of alcohol.

### Case 19: Death Certificate

107A	Drowning.	minutes
107B		
107C		
107D		
112	Acute alcohol intoxication.	
113		
Manner: Undetermined.		124.

### Case 20

- The skull and a few broken ribs of a small female were found buried in a shallow grave.
- Dental identification was used to confirm that the deceased was a 17 year old girl who had been abducted from her home 3 years before.
- Anthropologic evaluation revealed no tool marks or other signs of trauma. No other bones were found, despite an extensive search of the area.

### Case 20: Death Certificate

107A	Homicidal violence of undetermined etiology (skeletonized remains).	unknown
107B		
107C		
107D		
112		
113		
Manner: Homicide		124. Abducted and killed by another.

### Case 21

- A 45 year old man is combative and argumentative following a fender-bender.
- Police are called and attempt to subdue him. He is held in a prone restraint by four officers and handcuffed with his arms behind his back. When flipped over he is dead.
- Autopsy discloses a 290 lb man with scleral petechiae and no natural disease or injury. Toxicology is negative.

## Case 21: Death Certificate

107A	Positional asphyxia.	minutes
107B		
107C		
107D		
112	Obesity.	
113		

Manner: Homicide. (Accident?)	124. Prone restraint during arrest by law enforcement.
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## Case 22

- 69 year old woman is found dead in her ransacked apartment, bound and partially gagged (only mouth is covered).
- Autopsy discloses no internal injury, but marked ASCVD and a fibrotic left ventricular wall.

## Case 22: Death Certificate

107A	Cardiac arrhythmia	minutes
107B	Restraint during robbery	minutes
107C		
107D		
112	ASCVD	
113		

Manner: Homicide.	124. Bound and gagged during home invasion.
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## Case 23

- A 45 year old woman has her arm twisted in an assault.
- She suffers from post-traumatic sympathetic dystrophy and elects to undergo a cervical sympathectomy to relieve her pain.
- She dies under anesthesia.
- Autopsy is unremarkable except for multifocal ASCAD, with marked stenosis of two coronary arteries.

## Case 23: Death Certificate

107A	Intraoperative cardiac arrest	minutes
107B	Atherosclerotic coronary artery disease	years
107C		
107D		
112	Cervical sympathectomy for sympathetic dystrophy	
113	Sympathectomy (date)	

Manner: Natural.	124.
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