



PROJECT ECHO: OD-FIT

Overdose Fatality Investigation Techniques

Significant and Contributory Factors in Drug
Related Fatalities
March 29, 2022



Agenda

- Introductions and Warm-Up
- Didactic Presentation: Comorbidities with Dr. Daniel Dye
- BREAK
- Practice cases



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Contributory
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Related Fatalities

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What is a Death Certificate

STATE OF COLORADO CERTIFICATE OF DEATH

STATE FILE NUMBER

1. DECEDENT'S NAME (First, Middle, Last)			2. SEX	3. DATE OF DEATH (Month, Day, Year)		
4. SOCIAL SECURITY NUMBER		5a. AGE - (Years)	5b. UNDER 1 YEAR Mos Days	5c. UNDER 1 DAY Hrs Mins	6. DATE OF BIRTH Month Day Year	7. BIRTHPLACE (City and State or Foreign Country)
8. WAS DECEDENT EVER IN U.S. ARMED FORCES? <input type="checkbox"/> Yes <input type="checkbox"/> No		9a. PLACE OF DEATH (Check only one) HOSPITAL: <input type="checkbox"/> Inpatient <input type="checkbox"/> ER/Outpatient <input type="checkbox"/> DOA <input type="checkbox"/> Other (Specify) OTHER: <input type="checkbox"/> Assisted Living/Nursing Home <input type="checkbox"/> Hospice <input type="checkbox"/> Decedent's Residence				
9b. FACILITY NAME (If not institution, give street and number)			9c. CITY, TOWN, OR LOCATION OF DEATH		9d. COUNTY OF DEATH	
10a. DECEDENT'S USUAL OCCUPATION (Give kind of work done during most of working life. Do NOT use retired)			10b. KIND OF BUSINESS/INDUSTRY		11. MARITAL STATUS <input type="checkbox"/> Married <input type="checkbox"/> Never Married <input type="checkbox"/> Widowed <input type="checkbox"/> Divorced <input type="checkbox"/> Unknown	12. SPOUSE (If wife, give maiden name)
13a. RESIDENCE - STATE	13b. COUNTY	13c. CITY, TOWN, OR LOCATION		13d. STREET AND NUMBER		
13e. INSIDE CITY LIMITS? <input type="checkbox"/> Yes <input type="checkbox"/> No	13f. ZIP CODE	14. WAS DECEDENT OF HISPANIC ORIGIN? (If "Yes", specify Cuban, Mexican, Puerto Rican, etc.) <input type="checkbox"/> No <input type="checkbox"/> Yes Specify:		15. RACE: American Indian, Black, White, etc. (Specify)	16. EDUCATION: (Specify only highest grade completed). Elementary or secondary (0-12) College (13-16 or 17+)	
17. FATHER - NAME (First, Middle, Last)		18. MOTHER - NAME (First, Middle, Maiden)		19. INFORMANT - NAME and relationship to deceased		
20a. METHOD OF DISPOSITION <input type="checkbox"/> Burial/Entombment <input type="checkbox"/> Cremation <input type="checkbox"/> Removal from State <input type="checkbox"/> Donation <input type="checkbox"/> Other (Specify)		20b. PLACE OF DISPOSITION (Name of cemetery, crematory, or other place)		20c. LOCATION - City or Town, State		
21a. SIGNATURE OF FUNERAL DIRECTOR OR PERSON ACTING AS SUCH Signature			21b. NAME AND ADDRESS OF FACILITY Evergreen Mortuary 26024 N. Turkey Creek Road Evergreen, CO 80439			
22a. REGISTRAR'S SIGNATURE Signature				22b. DATE FILED (Month, Day, Year)		
23. TIME OF DEATH <input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Milt		24. DATE AND TIME PRONOUNCED DEAD Month Day Year Time		25. WAS CORONER NOTIFIED? <input type="checkbox"/> Yes <input type="checkbox"/> No		
TO BE COMPLETED BY SIGNING PHYSICIAN 25a. To the best of my knowledge, death occurred at the time, date and place, and due to the cause(s) and manner as stated. Signature			TO BE COMPLETED BY CORONER 27a. On the basis of examination and/or investigation, in my opinion death occurred at the time, date and place, and due to the cause(s) and manner as stated. Signature			
26b. DATE SIGNED (Month, Day, Year)			27b. DATE SIGNED (Month, Day, Year)			
26c. NAME, AND MAILING ADDRESS OF SIGNING PHYSICIAN			27c. NAME AND COUNTY			
29. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Undetermined			30. DID TOBACCO USE CONTRIBUTE TO DEATH <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Probably <input type="checkbox"/> Unknown		31. IF FEMALE: <input type="checkbox"/> Not pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
32a. DATE OF INJURY (Month, Day, Year)		32b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Milt		32c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No		
32e. PLACE OF INJURY - At home, farm, street, factory, office building, etc. (Specify)			32f. LOCATION INJURED (Street and Number or Rural Route Number, City, County, State)			
33. IMMEDIATE CAUSE - enter only one cause per line for (a), (b), and (c). Do not enter mode of dying (e.g. Cardiac or Respiratory Arrest) alone.						
Part 1. Conditions if any which gave rise to immediate cause stating the underlying cause last (c).		(a) DUE TO OR AS A CONSEQUENCE OF:		Interval between onset and death		
		(b) DUE TO OR AS A CONSEQUENCE OF:		Interval between onset and death		
		(c)		Interval between onset and death		
Part 2. OTHER SIGNIFICANT CONDITIONS - Conditions contributing to death but not related to cause in Part 1				34. AUTOPSY <input type="checkbox"/> Yes <input type="checkbox"/> No	35. If YES, were findings considered in determining cause of death? <input type="checkbox"/> Yes <input type="checkbox"/> No	

FUNERAL DIRECTOR

PHYSICIAN/CORONER

Objectives for March 2022 ECHO

- 1) Discuss what “Part 2” of the Death Certificate is, and why “Part 2” is available to certifiers completing Death Certificates.
- 2) Learn strategies to determine if using “Part 2” is appropriate.
 - “pre-existing or coexisting conditions” and “risk factors”
- 3) Using Case Scenarios, discuss some strategies/statements that a certifier can use in “Part 2” for drug related deaths.

What do we know?

- COD: An injury or disease which in a natural, unbroken sequence uninterrupted by an efficient intervening cause produces death and in whose absence death would not have occurred.
- The COD is listed as “Part 1” on a Death Certificate.

So what is “Part 2?” **And, what “Part 2” is NOT.

- Part 2: “Other Significant Conditions”
- For a Death Certificate: A pre-existing or coexisting disease or injury that contributed to death but DID NOT result in the underlying Cause of Death.
- Part 2 is also a certifier’s tweet!
- Part 2 is not a list of a decedent’s past medical history.

Example #1 (pre-existing/coexisting conditions)

- An individual with a history of coronary artery disease (stents placed in LAD and RCA one year ago) and hypertension presents to the Emergency Department with jaw and left shoulder pain. An ECG shows T-wave elevation, and his troponin is 0.55 ng/mL (range 0.04-0.39 ng/mL). Before the patient can receive a cardiac catheterization, he suddenly becomes unconscious and cannot be resuscitated. He is pronounced dead in the ED.
- COD (Part 1):
 - Acute myocardial Infarction
 - Due to
 - Coronary artery atherosclerosis
- Other significant conditions (Part 2)
 - Hypertension

Example #2 (risk factors)

- An individual with a history of coronary artery disease (stents placed in LAD and RCA one year ago) and hypertension presents to the Emergency Department with jaw and left shoulder pain. An ECG shows T-wave elevation, and his troponin is 0.55 ng/mL (range 0.04-0.39 ng/mL). Before the patient can receive a cardiac catheterization, he suddenly becomes unconscious and cannot be resuscitated. He is pronounced dead in the ED. **The patient's body mass index is 44.4 kg/m².
- COD (Part 1):
 - Acute myocardial Infarction
 - Due to
 - Coronary artery atherosclerosis
- Other significant conditions (Part 2)
 - Hypertension and obesity

Example #3 (When to “tweet.”)

- A law enforcement officer with a history of coronary artery disease (stents placed in LAD and RCA one year ago) and hypertension presents to the Emergency Department with jaw and left shoulder pain. The pain began while she was trying to arrest and handcuff an individual who was fleeing a convenience store. (The individual had reportedly robbed the store at gunpoint.) An ECG shows T-wave elevation, and her troponin is 0.55 ng/mL (range 0.04-0.39 ng/mL). Before the patient can receive a cardiac catheterization, she suddenly becomes unconscious and cannot be resuscitated. She is pronounced dead in the ED.
- COD (Part 1): Acute myocardial Infarction
 - Due to
Coronary artery atherosclerosis
- Other significant conditions (Part 2)
Physical exertion while apprehending fleeing suspect

But, this ECHO is about overdose deaths....

- For Part 1 vs Part 2 the question arises from the intersection of natural disease and drug toxicity.
- A certifier must decide, is the COD the drugs or the underlying disease or is it a combination of both.
- Choices:
 - 1) The tox results override any past medical history or findings at autopsy.
 - 2) The underlying disease is more important than the tox results.
 - 3) Can it be both????
- You have to consider the toxicology results in the context of the case. This means critically evaluating the “history” of present illness.

But, this ECHO is about overdose deaths....

- When do I list the disease in Part 1 and the drugs in Part 2 or vice versa?
 - DWD strategy: Read the history.
 - DWD's mom's strategy: Read the tox....
- Do I even need to mention the disease or drugs?
 - Is one related to the other? (Cocaine toxicity in person with colon cancer vs coronary artery atherosclerosis.)
 - Is it something that matters for public health? (Fentalogues in Jefferson County, AL)
- Why don't I just write everything down in Part 1?
 - How does that help vital statistics?
 - As much as I ask, "What would mom think?" I also ask, "What would the CDC think?"

But, this ECHO is about overdose deaths....

- Manner of Death
- If a drug toxicity is listed in Part 2, it is recommended to classify the death as “Accident”.
 - The reason for this suggestion is that death would not likely have occurred when it did, had the drug toxicity (an injury) not occurred.
 - Suicide, homicide, undetermined may be appropriate....

DWD Case

- A 45 year old man walked up to the UAB Emergency Department and told the guard at the door that his “arm hurt.” The guard informed him that if he wanted to come inside, he would have to go through the metal detector. He emptied his pockets and placed them into a plastic bowl and walked through the metal detector. Into the bowl, he placed a wallet, a bundle of papers, a lighter, and a glass tube that was burned on one end. The guard informed the man that he was going to be arrested for possession of drug paraphernalia. Before the man can leave or the guard can detain the man, he becomes unconscious and cannot be resuscitated. He is pronounced dead in the ED.
- The case was reported to the JCCMEO and jurisdiction was assumed.

Q1. Do you perform (or request) an autopsy?

- A) Yes
- B) No

Autopsy

- An autopsy was performed.
- NAME Autopsy Standards:
 - B3.3: the death is associated with police action.
 - B3.7: the death is by apparent intoxication by alcohol, drugs, or poison.....
 - B3.12: the forensic pathologist deems a forensic autopsy is necessary to determine cause or manner of death, or document injuries/disease, or collect evidence.
- The autopsy revealed narrowing of all major coronary arteries by atherosclerotic plaques. No evidence of injury and no other evidence of significant disease was identified.
- Tox testing was performed:
 - Iliac blood
 - Fentanyl: 0.7 µg/L
 - Diphenhydramine: Present (<0.025 mg/L)

Q2. How do you complete the Death Certificate?

- A) Part 1: Fentanyl and diphenhydramine toxicity.
 - Part 2: N/A
- B) Part 1: Coronary artery atherosclerosis.
 - Part 2: N/A
- C) Part 1: Fentanyl toxicity.
 - Part 2: Coronary artery atherosclerosis.
- D) Part 1: Coronary artery atherosclerosis.
 - Part 2: Stressed by police with threat of arrest.
- E) Part 1: Fentanyl toxicity.
 - Part 2: Stressed by police with threat of arrest.

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Case Scenarios

Tom- Case 1

- AJ is a 57-year-old black man with no known past medical history who was found dead at his home by a sibling when he missed a family function.
- He was last known alive the day before he was found.
- At the scene, there is a tablet which is marked as oxycodone. On a table near the decedent, there is a folded paper. On the paper is a white powder residue.
- An autopsy is performed and shows advanced coronary artery disease (90% blockages of left anterior descending and right coronary arteries) and a ruptured myocardial infarct of the anterior wall of the left ventricle of the heart with ~200 ml of blood with clot in the pericardial sac around the heart.
- Toxicology studies revealed cocaine 1.1 mg/L and benzoylecgonine 5.0 mg/L in blood. Oxycodone was not detected in blood but was reported positive in urine. The powder at the scene tested positive for cocaine. The oxycodone tablet tested positive for fentanyl.

Tom- Case 1 Polls

Check all the following elements that you believe should be included in Part 1 of the cause of death statement:

- A. Hemopericardium
- B. Ruptured myocardial infarction
- C. Acute cocaine intoxication
- D. Acute cocaine and oxycodone intoxication
- E. Atherosclerotic coronary artery disease
- F. Mixed drug intoxication with heart disease

Check all the following elements that you believe should be included in Part 2 of the cause of death statement:

- A. Hemopericardium
- B. Ruptured myocardial infarction
- C. Acute cocaine intoxication
- D. Acute cocaine and oxycodone intoxication
- E. Atherosclerotic coronary artery disease
- F. Mixed drug intoxication with heart disease

What would you select as the manner of death?

- A. Natural
- B. Accident
- C. Suicide
- D. Homicide
- E. Undetermined

Discuss! Answers on the next slide...

Tom- Case 1 Answers

- CAUSE OF DEATH
 - Hemopericardium
due to
Ruptured myocardial infarction
Due to
Atherosclerotic coronary artery disease
- OTHER SIGNIFICANT CONDITION
 - Acute cocaine intoxication
- MANNER OF DEATH
 - Accident

- A 40-year-old man was found dead in bed when he didn't awaken for breakfast. He was thought to be in his usual health the evening before. There was a history of sleep apnea for which he was prescribed a continuous positive airway pressure (CPAP) device and chronic knee pain related to obesity for which he was directed to take acetaminophen. His knee pain had worsened over the past several months. His wife stated that he hated using the CPAP machine which was found in the closet. The wife also thought that he might have taken some of her oxycodone left over from when she had her wisdom teeth extracted.
- At autopsy, there was morbid obesity. The decedent weighed 290 lbs and had a body mass index of 40. The heart was enlarged (550 gms) with thickening of the right and left ventricles. The coronary arteries had slight atherosclerosis without a significant stenosis (narrowing). There was slight atherosclerosis of the pulmonary artery reflective of pulmonary hypertension. The liver showed slight fatty change with no other damage of the liver cells.
- A toxicologic evaluation showed an ethanol concentration of 0.08 gm/dl, a sublethal but supratherapeutic concentration of oxycodone of 0.09 mg/L, and a slightly elevated concentration of acetaminophen (20 mg/L).

Discuss! Answer on the next slide...

I would certify the death as follows:

Cause of Death

- Part I: Oxycodone and ethanol toxicity
- Part II: Morbid obesity with sleep apnea and cardiac hypertrophy

Manner of Death

Accident

- RC is a 46-year-old black male with a history of poorly controlled hypertension and substance use disorder who collapses suddenly at her home.
- She complained of chest pain after snorting a white powder about one hour prior to collapse. The decedent discarded the container that she purchased which contained the white powder.
- She preferred herbal remedies and used them for multiple reasons, including high blood pressure. At autopsy she is mildly obese (BMI 32) and internal examination is remarkable for a dissection of the aorta which has ruptured into the pericardial space with approximately 350 ml compressing the heart. Her heart is enlarged (510 grams) and the kidneys are granular (microscopy confirms changes characteristic of hypertension).
- Toxicology is positive for cocaine at 1.8 mg/L and mitragynine at 45 mcg/L.

Q1. Check all the following elements that you believe should be included in Part 1 of the cause of death statement:

- A. Hemopericardium
- B. ruptured aortic dissection
- C. Hypertensive cardiovascular disease
- D. Obesity
- E. Acute cocaine intoxication
- F. Acute mitragynine intoxication
- G. Chronic drug use with mixed drug toxicity
- H. Cardiac arrest

Q2. Check all the following elements that you believe should be included in Part 2 of the cause of death statement:

- A. Hemopericardium
- B. ruptured aortic dissection
- C. Hypertensive cardiovascular disease
- D. Obesity
- E. Acute cocaine intoxication
- F. Acute mitragynine intoxication
- G. Chronic drug use with mixed drug toxicity
- H. Cardiac arrest
-

Q3. What would you select as the manner of death?

- A. Natural
- B. Accident
- C. Suicide
- D. Homicide
- E. Undetermined

Discuss! Answers on the next slide...

CAUSE OF DEATH PART 1

Hemopericardium

Due to

Ruptured aortic dissection

Due to

Acute intoxication by the combined effects of cocaine and mitragynine

OTHER SIGNIFICANT CONDITIONS, PART 2

- Hypertensive cardiovascular disease
- Obesity

MANNER OF DEATH:

Accident

Kelly-Case 4

- 52F lives with her boyfriend and his parents.
- Her boyfriend relayed a history of depression and fibromyalgia, he says he sometimes suspected she used drugs but never saw it, speculates she hid it from him. Her primary care physician denies those diagnoses but says there is history of GERD, chronic fatigue, hypercholesterolemia, hypothyroidism, and rheumatoid arthritis. Her physician also notes she has a drug history with cocaine and opioid use. She had a kidney stone a few months ago and left the hospital AMA with pain meds.
- Family confirms drug use, says they suspected a few days prior that she was using again. They also note recent weight loss, but no recent depression. A couple days before death she had a fever, was negative for covid and has been fine since. Boyfriend says he came home from work to find her convulsing in bed, she had been fine when he went to work, no significant depression lately.
- At autopsy there was a piece of cellophane occluding her airway, mild pulmonary congestion and minimal edema, intracranial meningioma.
- Toxicology was positive for gabapentin, trazodone, duloxetine, cocaine and fentanyl.

Discuss! Answer on the next slide...

Cause of Death for Part 1

A- aspiration of cellophane wrapper

Part 2

Other conditions- Combined effects of gabapentin, trazodone, duloxetine, cocaine and fentanyl

Manner of Death- Accident

Injury description

Ingestion of cellophane wrapper following ingestion of gabapentin, trazodone and duloxetine, with inhalation of cocaine and fentanyl

Kelly-Case 5

- 37M admitted to ER from home after being found down.
- Family says he has a history of drugs (heroin and Xanax abuse) and past blood clots, last clot was a year ago and he was treated in the ER only. He has no regular PMD.
- He was last known to be ok in his room, and dad suspected he was using, about 30 mins later dad heard him gurgling, then forced his way into the room and found him down on the ground, unresponsive. EMS administered Narcan.
- At autopsy he was noted to have occlusive thromboemboli on the right main pulmonary artery, moderate atherosclerosis and fecal impaction. He was 191lbs, 67".
- Toxicology was positive for amphetamines/methamphetamines, cocaine, lorazepam, naloxone and fentanyl.

Discuss! Answer on the next slide...

Kelly-Case 5 Answers

Cause of Death for Part 1

- Combined effects of amphetamines, methamphetamines, cocaine, lorazepam, and fentanyl with pulmonary embolism

Cause of Death for Part 2

- Other conditions- Unspecified chronic hypercoagulopathy

Manner of Death – Accident

Injury description

- ingestion/inhalation of methamphetamine, cocaine, lorazepam, and fentanyl