

COMPLETING THE DEATH CERTIFICATE FOR DRUG TOXICITY DEATHS

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- No financial disclosures.

OBJECTIVES

- Discuss the importance of correct certification of drug related fatalities.
- Discuss research that our office (JCCME) has published regarding certification of drug related deaths.
- Use information from the National Vital Statistics System report (May 2019) to get the most accurate information to the CDC and NCHS.
- Discuss some examples from the NVSS report to illustrate best practices for certification of drug toxicity deaths.
- BREAK
- Case examples from the Jefferson County Coroner/Medical Examiner Office.

CERTIFICATION STRATEGIES

- **Cause of death (Part 1):** Any injury or disease that produces a physiological derangement in the body that results in the death of an individual
 - The first domino...the big picture...the primary problem...the underlying issue
- **Contributing factors of death (Part 2):** Did not directly cause but likely contributed to death
 - Co-morbidities, risk factors, etc.
- **Mechanism of death:** The physiologic derangement produced by the cause of death that results in death
 - The last domino...the terminal event...the clinical problem
- **Manners of death:** natural, accident, homicide, suicide, undetermined
 - Reflects circumstances surrounding the death
 - Medical examiners will use all manners; clinicians will typically focus on NATURAL deaths
 - Used for public health purposes



18a. DATE PRONOUNCED DEAD (Mo/Day/Yr) 6/25/13		18b. TIME PRONOUNCED DEAD 20:56 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM		18c. NAME AND TITLE OF PERSON PRONOUNCING DEATH (PRINT/TYPE) [REDACTED]		19. WAS MEDICAL EXAMINER OR CORONER CONTACTED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
20. PART I. Enter the chain of events—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.						APPROXIMATE INTERVAL: Onset to Death	
IMMEDIATE CAUSE (Final disease or condition resulting in death)		a. <u>Cardiac Arrest</u> Due to (or as a consequence of)				6/22/13 - 6/25/13	
Sequently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		b. <u>Respiratory failure</u> Due to (or as a consequence of)				6/22/13 - 6/25/13	
		c. <u>Traumatic Brain injury</u> Due to (or as a consequence of)				6/22/13 - 6/25/13	
PART II. Enter other <u>pre-existing conditions contributing to death</u> but not resulting in the underlying cause given in PART I.						21a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
						21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
22. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Could not be determined							
23. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown				24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death			
25a. DATE OF INJURY (Mo/Day/Yr)		25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM		25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area)		25d. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	
25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)							
25f. DESCRIBE HOW INJURY OCCURRED						25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)	
26a. CERTIFIER (Check only one): <input type="checkbox"/> Certifying Physician - To the best of my knowledge, death occurred due to the cause(s) and manner stated. <input checked="" type="checkbox"/> Pronouncing & Certifying Physician - To the best of my knowledge, death occurred at the time, date, and place, and due to the cause(s) and manner stated. <input type="checkbox"/> Medical Examiner - 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 stated. <input type="checkbox"/> Coroner - 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 stated. <input type="checkbox"/> Hospice Registered Nurse - To the best of my knowledge, death occurred due to the cause(s) and manner stated.							
SIGNATURE: [REDACTED]				TITLE: <u>M.D.</u>		DATE: <u>6/25/13</u> (Mo/Day/Yr)	
26b. NAME AND COMPLETE MAILING ADDRESS OF PERSON SIGNING ITEM 26a (Type/Print)						26c. LICENSE #	
[REDACTED]						[REDACTED] ident	
27a. SIGNATURE OF REGISTRAR						27b. FOR REGISTRAR USE ONLY - DATE FILED (Mo/Day/Yr)	

18a. DATE PRONOUNCED DEAD (Mo/Day/Yr) 11/20/2011		18b. TIME PRONOUNCED DEAD 12:10 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM		18c. NAME AND TITLE OF PERSON PRONOUNCING DEATH (PRINT / TYPE) [REDACTED]		19. WAS MEDICAL EXAMINER OR CORONER CONTACTED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
20. PART I. Enter the <u>chain of events</u> —diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.							
IMMEDIATE CAUSE (Final disease or condition resulting in death)		CAUSE OF DEATH				APPROXIMATE INTERVAL: Onset to Death	
a. <u>Cardiopulmonary Arrest</u>		Due to (or as a consequence of)				≈ 2 hours	
b. <u>Prolonged hypoperfusion</u>		Due to (or as a consequence of)				> 2 hours	
c. <u>Prolonged hypoventilation</u>		Due to (or as a consequence of)				> 2 hours	
d. _____		Due to (or as a consequence of)					
PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.						21a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
						21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
22. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Could not be determined							
23. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown				24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death			
25a. DATE OF INJURY (Mo/Day/Yr)		25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM		25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area)		25d. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	
25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)							
25f. DESCRIBE HOW INJURY OCCURRED.						25g. IF TRANSPORTATION INJURY, SPECIFY. <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)	
26a. CERTIFIER (Check only one): <input type="checkbox"/> Certifying Physician - To the best of my knowledge, death occurred due to the cause(s) and manner stated. <input checked="" type="checkbox"/> Pronouncing & Certifying Physician - To the best of my knowledge, death occurred at the time, date, and place, and due to the cause(s) and manner stated. <input type="checkbox"/> Medical Examiner - 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 stated. <input type="checkbox"/> Coroner - 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 stated. <input type="checkbox"/> Hospice Registered Nurse - To the best of my knowledge, death occurred due to the cause(s) and manner stated.							
SIGNATURE: [REDACTED]		TITLE: <u>M.D.</u>		DATE: <u>11/20/2011</u>		(Mo/Day/Yr)	
26b. NAME AND COMPLETE MAILING ADDRESS OF PERSON SIGNING ITEM 26a. (Type / Print) [REDACTED]						26c. LICENSE # <u>E-6830</u>	
27a. SIGNATURE OF REGISTRAR						27b. FOR REGISTRAR ONLY - DATE FILED (Mo/Day/Yr)	

To Be Completed / Verified by MEDICAL CERTIFIER

A. Immediate Cause (Final Disease or condition resulting in death):

Most recent condition

Approximate Interval Between
Onset and Death

☐ Unknown

B. Underlying Cause (Due to or as consequence of):

Next oldest condition

☐ Unknown

C. Underlying Cause (Due to or as consequence of):

Oldest (initiating) condition

☐ Unknown

D. Underlying Cause (Due to or as consequence of):

☐ Unknown

Other Significant Conditions

Contributing to death but not resulting in the underlying cause(s) stated above:

Conditions not directly resulting in the
cause of death, but significant
contributor

Add

Remove

THINGS THAT ARE HELPFUL

- COD: Probable natural causes
- COD: Arteriosclerotic cardiovascular disease
- COD: Hypertensive heart disease
- COD: Chronic alcoholism
 - Complications of chronic alcoholism
- COD: Complications of _____ carcinoma
- COD: Chronic illicit drug use/abuse

A. Immediate Cause (Final Disease or condition resulting in death):

Bleeding esophageal varices

B. Underlying Cause (Due to or as consequence of):

Cirrhosis

C. Underlying Cause (Due to or as consequence of):

Chronic alcoholism

D. Underlying Cause (Due to or as consequence of):

Approximate Interval Between Onset and Death

Adm - death

years

years

LISTING PRE/CO-EXISTING CONDITIONS

A. Immediate Cause (Final Disease or condition resulting in death):

Acute myocardial infarction

Approximate Interval Between
Onset and Death

☐ Unknown

B. Underlying Cause (Due to or as consequence of):

Atherosclerotic coronary artery disease

☐ Unknown

C. Underlying Cause (Due to or as consequence of):

☐ Unknown

D. Underlying Cause (Due to or as consequence of):

☐ Unknown

Other Significant Conditions

Contributing to death but not resulting in the underlying cause(s) stated above:

Hypertension
Diabetes Mellitus
Obesity

Add

Remove



LET'S TALK FIRST ABOUT SIDS

- Sudden Infant Death Syndrome is two-fold.
 - Firstly, SIDS is not an etiologically specific cause of death. SIDS is a cluster of circumstances that commonly occur together: an unexplained sudden death, an investigation that fails to identify a cause, and a negative autopsy and ancillary tests. Sudden Infant Death Syndrome is not due to one unidentified etiology.
 - Secondly, some incorrectly believe that infant deaths which remain unexplained after thorough investigation and autopsy are natural in manner, i.e. a natural medical entity. Sudden, unexplained infant deaths cannot be assumed to be natural in manner; doing so would result in a missed opportunity for prevention.
- Focus more on Scene Investigation and attention to environment: National Association of Medical Examiners work:
 - NAME Ad Hoc Committee on Sudden Unexplained Infant Death. (2006)
 - Sudden Unexplained Infant Death Investigation. A Systematic Training Program for the Professional Infant Death Investigation Specialist (2007), The Infant Death Investigation: Guidelines for the Scene Investigator (2007), and Sudden Unexplained Infant Death Reporting Form (2006)

LET'S TALK FIRST ABOUT SIDS

- Culmination of NAME recommendations and education:
 - 1. Certification of deaths consistent with the definition of SIDS was to report the cause of death as “Sudden Unexplained Infant Death” and the manner as Undetermined.
 - 2. Reporting of conditions, risk factors and possible external stressors (e.g. focal bronchiolitis, prenatal tobacco exposure, bed sharing, prone found position, excessive blanketing etc.), when present, in Part II of the death certificate was recommended.
 - 3. HOWEVER: some certifiers continue using “Undetermined”, with or without the risk factors etc. in Part II. Thus, deaths previously certified as Sudden Infant Death Syndrome or Sudden Unexplained Infant Death are increasingly certified as Undetermined or as due to an asphyxial process.
- UPSHOT: Most Medical Examiners in the United States do not certify deaths as “SIDS”, but because of the mixed system of Death Certification in the US, the data on death certificates is difficult to work with because of inconsistencies.

LET'S TALK FIRST ABOUT SIDS

- **2011: The Death of SIDS Nashelsky & Pinckard**
- ABSTRACT: Sudden Infant Death Syndrome (SIDS) is an overly broad classification...
- There is a prevailing false concept that SIDS is a “real” and discrete diagnostic entity rather than a phrase that signifies an inability to state why an infant has died.
- This has been perpetuated by the International Statistical Classification of Diseases and Related Health Problems (ICD-10), which recognizes SIDS as a “cause” of death.
- We propose simplified, unambiguous language for the death certificate in cases of sudden unexplained infant death. We propose changes to ICD-10 nomenclature and vital statistics tabulation.

LET'S TALK ABOUT THE NATIONAL CENTER FOR HEALTH STATISTICS

- Causes of death are tracked using ICD (International Statistical Classification of Disease and Related Health Problems) codes, published by the WHO. (currently the 10th revision *ICD-10)
- Infant deaths:
 - 1) R95: Unexpected infant deaths (Sudden Infant Death Syndrome)
 - 2) R99: "Undetermined" (other ill-defined and unspecified causes of mortality)
 - 3) W75: Accidental suffocation/strangulation in bed (asphyxia)

EFFECT OF PART II ON CODING WHEN COD IS “UNDETERMINED”

Part I/COD (age on certificate <365 days)	Part II/CCOD	ICD-10 Underlying Cause Code	Code Title
Undetermined		R99	Other ill-defined and unspecified causes of mortality
Undetermined	Risk factor: Bed sharing, Prone sleep	R99	Other ill-defined and unspecified causes of mortality
Undetermined	Risk factors: Bed sharing, Acute tracheitis	J041	Acute tracheitis
Undetermined	Former premature infant sleeping between adults	P073	Prematurity
Undetermined	Possible asphyxia due to bed sharing	W75	Accidental suffocation and strangulation in Bed
Undetermined	Possible Sudden Infant Death Syndrome	R95	Sudden Infant Death Syndrome
Sudden Unexplained Infant Death	Co-sleeping	R95	Sudden Infant Death Syndrome

EXAMPLE #1

- 23 year old white male found dead in parked vehicle.
 - Known drug user to law enforcement.
 - No evidence of trauma to body to explain death.
- Tox results:
 - UDS: Opiates P, Cocaine Metabolite P
 - Blood, Peripheral:
 - Ecgonine methyl ester: present
 - Cocaine: ND
 - Morphine: 0.113 mg/L
 - Codeine: 0.009 mg/L
 - Ethanol: 0.04 gm/dL

COD???

- Morphine and codeine toxicity?
- Cocaine and opiate toxicity?
- Heroin toxicity?
- Morphine, codeine, and ethanol toxicity?

Forensic Sci Med Pathol. 2016; 12: 243–247.

PMCID: PMC4967084

Published online 2016 Apr 25. doi: [10.1007/s12024-016-9780-2](https://doi.org/10.1007/s12024-016-9780-2)

PMID: [27114260](https://pubmed.ncbi.nlm.nih.gov/27114260/)

Identifying cases of heroin toxicity where 6-acetylmorphine (6-AM) is not detected by toxicological analyses

Ashley D. Ellis,¹ Gerald McGwin,² Gregory G. Davis,² and Daniel W. Dye^{✉2}

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This article has been [cited by](#) other articles in PMC.

Abstract

Go to: 

Purpose

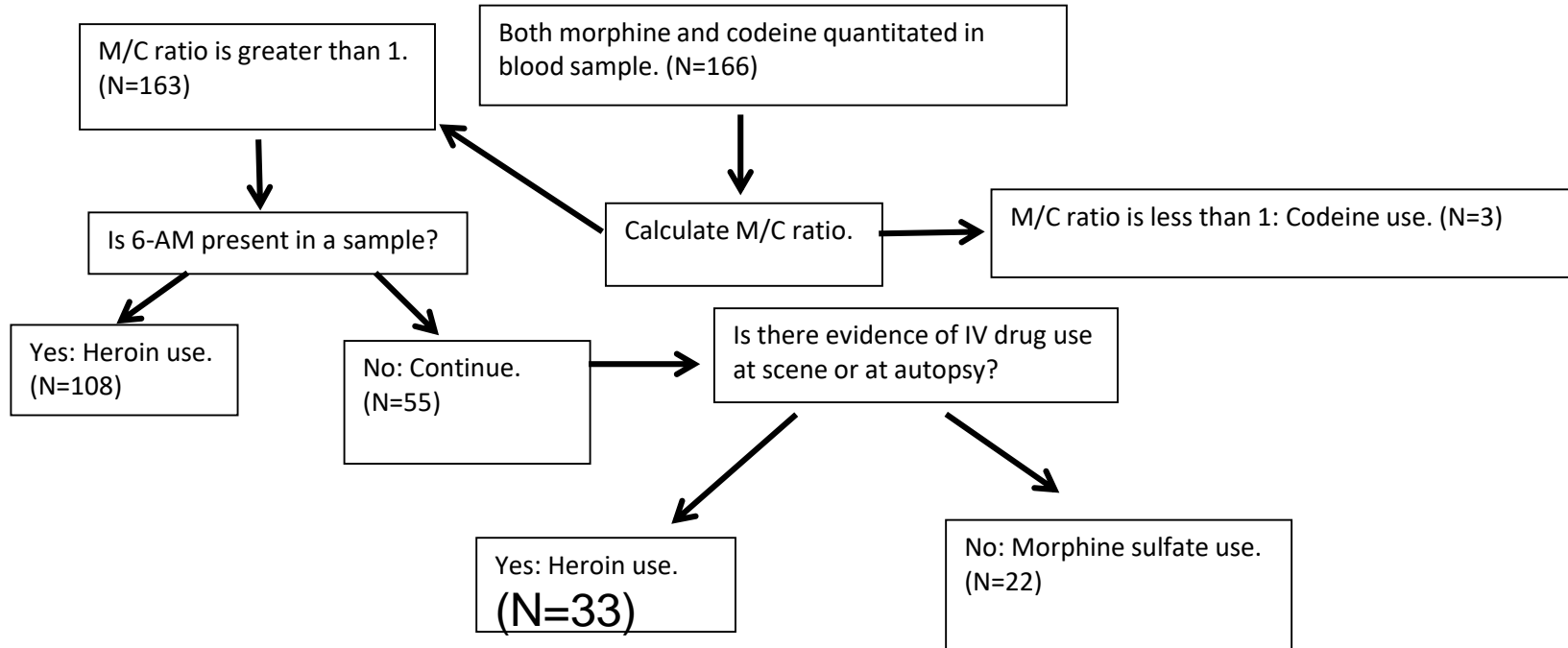
Heroin has a half-life of 2–6 min and is metabolized too quickly to be detected in autopsy samples. The presence of 6-acetylmorphine (6-AM) in urine, blood, or other samples is convincing evidence of heroin use by a decedent, but 6-AM itself has a half-life of 6–25 min before it is hydrolyzed to morphine, so 6-AM may not be present in sufficient concentration to detect in postmortem samples. Codeine is often present in heroin preparations as an impurity and is not a metabolite of heroin. Studies report that a ratio of morphine to codeine greater than one indicates heroin use. We hypothesize that the ratio of morphine to codeine in our decedents abusing drugs intravenously will be no different in individuals with 6-AM present than in individuals where no 6-AM is detected, and we report our study of this hypothesis.

Methods

All accidental deaths investigated by the Jefferson County Coroner/Medical Examiner Office from 2010 to 2013 with morphine detected in blood samples collected at autopsy were reviewed. Five deaths where trauma caused or contributed to death were excluded from the review. The presence or absence of 6-AM and the concentrations of morphine and codeine were recorded for each case. The ratio of morphine to codeine was calculated for all decedents. Any individual in whom no morphine or codeine was detected in a postmortem sample was excluded from further study. Absence or presence of drug paraphernalia or evidence of intravascular (IV) drug use was documented in each case to identify IV drug users. The proportion of the IV drug users with and without 6-AM present in a postmortem sample was compared to the M/C ratio for the individuals.

Results

INTERPRETING MORPHINE AND CODEINE DETECTED BY TOX TESTING





TOX-RELATED DEATHS

- A view from our world
- Standard B3.7: “The forensic pathologist **shall perform a forensic autopsy** when the death is by apparent intoxication by alcohol, drugs, or poison, unless a significant interval has passed, and the medical findings and absence of trauma are well documented.”

Forensic Autopsy Performance Standards



Prepared by:
Garry F. Peterson, M.D. (Committee Chair, 2005)
Steven C. Clark, Ph.D. (NAME Consultant)

Approved by General Membership
October 17, 2005 NAME Annual Meeting, Los Angeles, California
October 4, 2010 NAME Annual Meeting, Cleveland, Ohio

Amendments Approved by General Membership
October 16, 2006 NAME Annual Meeting, San Antonio, Texas
August 11, 2011 NAME Annual Meeting, Ketchikan, Alaska
October 8, 2012 NAME Annual Meeting, Baltimore, Maryland
September 22, 2014 NAME Annual Meeting, Portland, Oregon
October 4, 2015 NAME Annual Meeting, Charlotte, North Carolina
September 12, 2016 NAME Annual Meeting, Minneapolis, Minnesota

(Sunset date Annual Business Meeting in 2020)

HYPOTHESIS

- A full autopsy is not necessary to correctly classify the cause and manner of death in cases of drug toxicity.
- Observation: rarely does information from an autopsy offer additional info
 - Investigation
 - External examination
 - Toxicological analysis
- Blinded “test” for 3 boarded forensic pathologists
 - <5 years, 5-10 years, >20 years

CASE EXAMPLES

- **Scene/Investigation:**
 - Law enforcement responded to a residence
 - Unresponsive person known as an IV drug user
 - LEA history of multiple overdose calls
 - No drug paraphernalia was observed at the scene
- **Inspection:**
 - 60 year old white male (BMI 23.5 kg/m²)
 - Linear scars on both forearms; nothing recent

CASE EXAMPLES

- No autopsy/Toxicology

Specimen	Analysis	Method	Results*
Blood, Central	Ethanol	GC	ND
Urine	DA	EMIT	Benzodiazepines, P
Urine	DA	EMIT	6-MAM, P, Opiates, P
Blood, Peripheral	Codeine	GC/MS	P<0.025
Blood, Peripheral	Morphine	ARUP	0.052

- Screening and confirmatory testing
 - Morphine : Codeine ratio > 1 = Heroin use
 - 6-MAM (Urine screening test)
- DC: Heroin Toxicity (ACC)
- Autopsy/Toxicology
 - Chronic Hepatitis
 - DC: Heroin Toxicity (ACC)

CASE EXAMPLES

- **Scene/Investigation:**

- Unresponsive in bed; found by husband
- PMH: hypertension, chronic low back pain, depression
- No foul play, drugs, inaccurate pill counts

- **Inspection:**

- 70 year old white female (BMI 31.2 kg/m²)
- Contusions on head and extremities- some healing

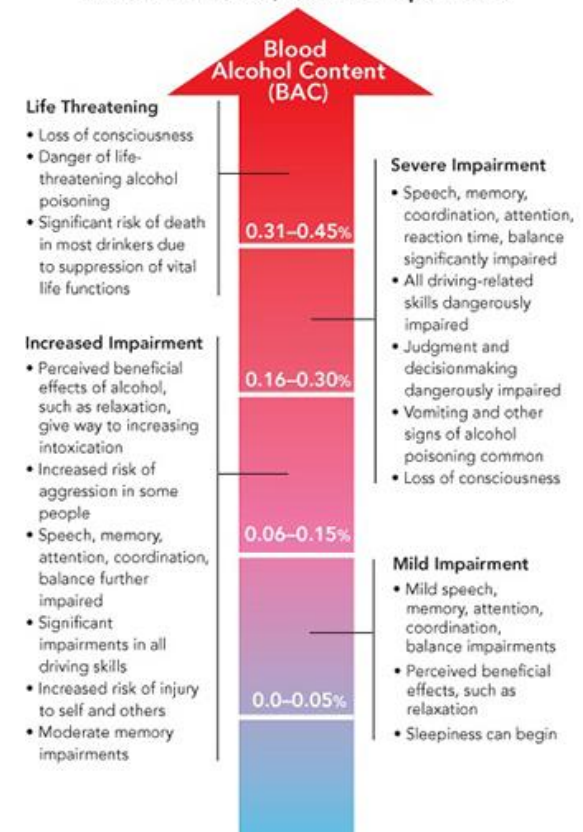
CASE EXAMPLES

- No autopsy/Toxicology

Specimen	Analysis	Method	Results*
Blood, Central	Ethanol	GC	0.23
Vitreous	Ethanol	GC	0.28
Bile	DA	EMIT	NDD

- Severe impairment usually
- DC: Ethanol intoxication (ACC)
- Get some history
 - Described as chronic alcoholic
 - Admissions to hospital for minor falls
- DC: Chronic alcoholism (NAT)

As BAC Increases, So Does Impairment



CASE EXAMPLES

- Autopsy/Toxicology
 - Mitral Valve leaflet fusion
 - Calcification of Aortic Valve
 - Enlarged heart (480 g) with LVH
 - Blunt force injuries (contusions)
 - Cirrhosis
 - DC: Probable dysrhythmia d/t valvular heart disease (NAT)
 - Cont: Chronic alcohol use.

RESULTS

- Only moderate agreement among FPs
- Causes of Death
 - With h/o drug use or drug paraphernalia at scene: “got it right” 80-85% of cases
 - With no drug use or paraphernalia at scene: “got it right” 40-80% of the time
- Manners of death
 - Wide variability among agreement in both scenarios (with and without drug history)
- The correct COD/MOD can be determined 75-80% of the time
 - Is this accuracy acceptable?

BEST CASE SCENARIOS

- Decedents with drug use history
- Scenes with drug paraphernalia
- Complete toxicology testing
 - 75% COD accuracy
 - 80% MOD accuracy
- Our office is satisfied with current practice and of increased accuracy with autopsy

Dye DW, McGwin G, Atherton D, McCleskey B, Davis G.
Correctly identifying deaths due to drug toxicity without a forensic autopsy. Am J Forensic Med Pathol 2019;40(2):99-101.

Vital Statistics Reporting Guidance

Report No. 2 • May 2019



A Reference Guide for Completing the Death Certificate for Drug Toxicity Deaths

Introduction

Death certificates provide critical information used by public health officials to detect trends in mortality overall and by cause. State and national mortality statistics based on death certificate data are often used to help determine which medical conditions receive research and prevention funding; set public health goals; and measure population health status at the local, state, and national levels. Because statistical data derived from death certificates are only as accurate as the information provided, it is important that all persons involved in death registration strive for completeness and accuracy in reporting the circumstances and causes contributing to the death. Detailed and specific information on cause and manner of death allows for greater accuracy in determining the underlying and contributory causes of death.

Instructions for medical examiners, coroners, and other medical certifiers on how to complete the death certificate can play an important role in improving the quality of mortality data.

By following the instructions provided in this Reference Guide, certifiers will help ensure that their findings reported on death certificates are appropriately conveyed to others who use death certificate information for standardized statistical reporting and public health promotion.

Completing the Death Certificate for Drug Toxicity Deaths

Deaths in which drug toxicity is suspected to be involved should be referred to the local medical examiner or coroner because these deaths generally fall under their jurisdiction. In most cases, the medicolegal death investigation office will assume jurisdiction of the case, conduct a medicolegal death investigation, and determine the cause and manner of death.

The accuracy of the death certification is dependent on a thorough investigation of the death. Determining the cause and manner of death, and in particular the degree of drug involvement in a

DRUG TOXICITY DEATHS

- For Cause of Death (Part 1):
 - 1) Include names of specific drugs that cause the death if possible: (Alparazolam toxicity; not Xanax toxicity)
 - 2) List all of the drugs on the same line if possible or use multiple lines and the connector “and” between lines. (Should not be a problem if you’re using an electronic Death Certificate Program)
 - 3) **Avoid** COD such as: Drug(s) intoxication; Mixed drug toxicity; polypharmacy.
 - 4) If you have only the drug class, list the class. **If you know the name of the drug, do not list the class; just list the drug.
 - 5) List the parent drug, do not list metabolites. (Remember what we discussed about heroin, morphine, and codeine.)
 - 6) If you need “probable” to make you happy, you can use that. *Causes of Death adhere to the “more likely than not standard” meaning that they are more likely to be true rather than false (greater than 50% chance that the statement is true).
 - 7) Use “toxicity; poisoning; overdose” to indicate an acute event; an accidental death. Use terms like “use, abuse, misuse, dependence, addiction” to indicate chronic problems; a natural death.
 - 8) Save the words “Ingested, took, inhaled, used” for “Describe How Injury Occurred” and do not use these terms in the COD. (These terms could lead to your case being miscoded; remember what we discussed about SIDS deaths.)

DRUG TOXICITY DEATHS

- For Contributing Factor(s) (Part 2):
 - 1) List any conditions that may have contributed to the death, but are not part of the causal sequence reported in Part 1.
 - 2) Do not list all of a decedent's past medical history.
 - 3) PLEASE TALK TO YOUR LOCAL DEPARTMENT OF HEALTH!!!!

DRUG TOXICITY DEATHS

- Completing “Describe How Injury Occurred”:
 - 1) Tell us what you know; or what is more likely than not.
 - 2) List the route of administration of the drug(s). “Oral ingestion, injected, snorted, huffed, smoked, etc”
 - 3) List the source of the drug(s). “Prescribed to decedent, illicit preparation, diverted from another individual’s prescription, etc.”
 - 4) Type of drug formulation. “Long acting, extended release, immediate release, etc.” NOTE: I rarely know/report this.
- Examples: “Decedent injected illicit drugs obtained from unknown source.” or “Decedent probably injected illicit drugs obtained from unknown source – syringe found in pocket.”

DRUG TOXICITY DEATHS

- Completing “Manner of Death”:
- Deaths due to ACUTE drug toxicity are not “Natural” deaths.
- Deaths due to CHRONIC drug use/abuse are “Natural” deaths.
- Most deaths due to drug toxicity are best classified as “Accident(s)” for vital statistical purposes.
- “Suicide” should be reserved for deaths where there is evidence that an individual ingested/injected/inhaled a drug to cause self-harm. (Final Exit by Derek Humphry)
- “Homicide” should be reserved for deaths due to a poisoning that occurs from a volitional act committed by another person to cause fear or harm or death. (Judicial executions are “homicides”.)
- “Could not be determined” or “undetermined” is intended solely for deaths in which, after an investigation, the manner of death cannot be classified with reasonable certainty.

DRUG TOXICITY DEATHS

- Completing “Where Injury Occurred”:
- 1) For “Place of Injury” you need to be general and for “Location of Injury” you need to be specific.
- 2) If you know where the individual took the drug(s) enter that location in the “Location of Injury” field.
- 3) If you don’t know where the person took the drug, but do know where they were found, then list the location where they were found for “Location of Injury”.
- 4) For “Place of Injury” “apartment, decedent’s residence, parent’s home, roadway, abandoned building, etc.” are acceptable.
- 5) For “Location of Injury” the address/mile marker/city, state

DRUG TOXICITY DEATHS

- WE'RE ALMOST TO THE BREAK!
- Pitfalls...
- 1) We have talked about having as much information as possible (scene/past medical history/autopsy report/toxicology report) but sometimes you may have to work with limited information.
- 2) Deaths from chronic drug use (cirrhosis from chronic alcoholism or bacterial endocarditis due to intravascular drug use) are “natural” deaths.
- 3) Deaths due to disease that are exacerbated by an acute drug toxicity (an individual with coronary artery disease who smokes crack cocaine) are “accidents”. **We will discuss how to deal with this on a death certificate.
- 4) Individuals can sustain traumatic injuries that cause death after using a drug (or drugs). **We will discuss how to deal with the individual who crashes into a concrete wall after injecting heroin.

BREAK

- BREAK



TOX DEATH #1 (YOU'RE LIVING RIGHT!)

- A 33 year old man was found dead at his office by his father. The decedent was a partner at his father's law firm and was found in the bathroom of the office. The bathroom door was secured with a single latch and the decedent's father broke the latch when he kicked in the door. The decedent's father reported that his son had struggled with heroin use for years and the decedent's father also led law enforcement officers to a syringe and needle that were located in the bathroom trash can.
- External exam: One needle puncture mark identified on the left ACF.
- Autopsy: No evidence of significant natural pathology except cardiomegaly (450 grams).
- Tox results:
 - UDS: Opiates P, 6-Acetyl morphine P
 - Blood, Peripheral:
 - Morphine: 0.113 mg/L
 - Codeine: 0.009 mg/L

CAUSE OF DEATH			
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>			<p>APPROXIMATE INTERVAL: Onset to Death</p>
<p>IMMEDIATE CAUSE (First disease or condition resulting in death) →</p> <p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p>a. <u>Heroin toxicity</u> Due to (or as a consequence of)</p> <p>b. _____ Due to (or as a consequence of)</p> <p>c. _____ Due to (or as a consequence of)</p> <p>d. _____</p>		
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>		<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>			
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown</p>		<p>24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>	
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <u>Office bathroom</u></p>	<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>			
<p>25f. DESCRIBE HOW INJURY OCCURRED: <u>Injected illicit substance obtained from unknown source</u></p>			<p>25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>

NO!

TOX DEATH #2 (OUR USUAL SUSPECT)

- A 22 year old woman was found dead in her hotel room. The room was secure and the decedent was found on the floor next to the bed by the housekeeping staff. Bottles of alcohol were found in the room and a container of various pills was found in the bathroom by the evidence technician (Logan) working the scene. Coroner Perryman identified a white substance on a countertop in the room and a sample was collected by the evidence technician.
- External exam: No evidence of trauma to explain death.
- Autopsy: No evidence of significant natural pathology.
- Tox results:
 - UDS: Amphetamines P, Opiates P, Fentanyl P, Tricyclic Antidepressants P
 - Blood, Peripheral:

• Amitriptyline	GC/MS	0.116 mg/L
• Nortriptyline	GC/MS	0.320 mg/L
• Citalopram	GC/MS	0.154 mg/L
• Fentanyl	GC/MS	0.039 mg/L
• Amphetamine	ARUP	0.093 mg/L
• Methamphetamine	ARUP	>1.0 mg/L

CAUSE OF DEATH			
20. PART I. Enter the <u>chain of events</u> —diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.			APPROXIMATE INTERVAL: Onset to Death
IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. <u>Fentanyl and methamphetamine toxicity</u> Due to (or as a consequence of)		
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.	b. _____ Due to (or as a consequence of)		
	c. _____ Due to (or as a consequence of)		
	d. _____ Due to (or as a consequence of)		
PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.			21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined			
23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown		24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death	
25a. DATE OF INJURY (Mo/Day/Yr)	25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM	25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <u>Hotel room</u>	25d. INJURY AT WORK? Yes No
25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)			
25f. DESCRIBE HOW INJURY OCCURRED: <u>Decedent probably inhaled illicit drugs obtained from unknown source; white powder on countertop near body</u>			25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____

TOX DEATH #3A (THE SLEEPER)

- A 57 year old man was found dead at his home. The decedent was found face down on the living room floor in front of his recliner. The residence was secure and the decedent was discovered by his son after the son had been unable to contact his dad one morning. The son reported that his dad did not have a primary care physician and had had last seen a doctor (ED visit) sometime in the spring after he fell at his home. The law enforcement officer at the scene reported no evidence of drug use/abuse. Because of limited medical history Deputy Coroner Russell brought the case to Cooper Green.
- External exam: No evidence of trauma to the body.
- **NO Autopsy was performed: Radiographs were taken that showed no evidence of recent injury and a markedly enlarged cardiac silhouette.
- Tox results:
 - UDS: Cocaine metabolite, P
 - Blood, Peripheral:
 - Ecgonine Methyl Ester P
 - Cocaine 0.225 mg/L

CAUSE OF DEATH			
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>			<p>APPROXIMATE INTERVAL: Onset to Death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death) →</p> <p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p style="font-size: 1.2em; text-align: center;">Hypertensive cardiovascular disease</p> <p>a. _____ Due to (or as a consequence of)</p> <p>b. _____ Due to (or as a consequence of)</p> <p>c. _____ Due to (or as a consequence of)</p> <p>d. _____</p>		
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p> <p style="font-size: 1.2em; text-align: center;">Cocaine toxicity</p>			<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>			
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown</p>		<p>24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>	
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <div style="font-size: 1.5em; text-align: center;">Residence</div> </p>	<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>			
<p>25f. DESCRIBE HOW INJURY OCCURRED: <div style="font-size: 1.2em; text-align: center;">Decedent with heart disease used illicit drug</div> </p>			<p>25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>

NO!

CAUSE OF DEATH				APPROXIMATE INTERVAL: Onset to Death
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>				
<p>IMMEDIATE CAUSE (First disease or condition resulting in death) →</p> <p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p style="font-size: 1.2em; text-align: center;">Cocaine toxicity</p> <p>a. _____ Due to (or as a consequence of)</p> <p>b. _____ Due to (or as a consequence of)</p> <p>c. _____ Due to (or as a consequence of)</p> <p>d. _____</p>			
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p> <p style="font-size: 1.2em; text-align: center;">Hypertensive heart disease</p>				<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>				
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p>Yes Probably No Unknown</p>		<p>24. IF FEMALE:</p> <p><input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year</p> <p><input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>		
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area)</p> <p style="font-size: 1.5em; text-align: center;">Residence</p>		<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>				
<p>25f. DESCRIBE HOW INJURY OCCURRED:</p> <p style="font-size: 1.2em; text-align: center;">Decedent with heart disease used illicit drug</p>				<p>25g. IF TRANSPORTATION INJURY, SPECIFY:</p> <p><input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>

NO!

TOX DEATH #3B (THE *REAL* SLEEPER)

- A 57 year old man was found dead at his home. The decedent was found face down on the living room floor in front of his recliner. The residence was secure and the decedent was discovered by his son after the son had been unable to contact his dad one morning. The son reported that his dad did not have a primary care physician and had had last seen a doctor (ED visit) sometime in the spring after he fell at his home. The law enforcement officer at the scene reported no evidence of drug use/abuse. Because of limited medical history Deputy Coroner Russell brought the case to Cooper Green.
- External exam: No evidence of trauma to the body.
- **NO Autopsy was performed: Radiographs were taken that showed no evidence of recent injury and a markedly enlarged cardiac silhouette.
- Tox results:
 - UDS: Cocaine metabolite, P
 - Blood, Peripheral:
 - Ecgonine Methyl Ester P
 - Cocaine P<0.025 mg/L

CAUSE OF DEATH			
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>			<p>APPROXIMATE INTERVAL: Onset to Death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death) →</p>	<p>a. <u>Hypertensive cardiovascular disease</u></p> <p style="text-align: center;">Due to (or as a consequence of)</p>		
<p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the</p>	<p>b. _____</p> <p style="text-align: center;">Due to (or as a consequence of)</p>		
<p>UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p>c. _____</p> <p style="text-align: center;">Due to (or as a consequence of)</p>		
<p>d. _____</p>			
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>			<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </p>
<p>22. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Accident <input type="checkbox"/> Suicide <input type="checkbox"/> Homicide <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Could not be determined</p>			
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown </p>		<p>24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death </p>	
<p>24a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <u>Resience</u></p>	<p>25d. INJURY AT WORK? Yes No </p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>			
<p>25f. DESCRIBE HOW INJURY OCCURRED:</p>			<p>25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____ </p>

NO!

TOX DEATH #4 (THE GROCERY LIST)

- A 20 year old man was found dead in his bed by his aunt. The decedent had foam coming from his mouth at the time of discovery and his girlfriend reported that he had been “high” the night before being found. I, Deputy Coroner Moore, did not go to the scene because I was working the case in Bessemer when contacted by BPD. I spoke to the decedent’s girlfriend who reported that he had injected heroin; I also spoke to the decedent’s mother who reported that the decedent had no medical problems and did not use drugs or alcohol.
- External exam: No evidence of recent injury observed except healing curvilinear abrasions on legs.
- Autopsy: Chronic hepatitis and polarizable material identified in pulmonary lymphovascular spaces.
- Tox results:
 - Blood Ethanol GC ND
 - Urine: Amphetamines P, Cocaine Metabolite P, Tricyclic Antidepressants P, 6-MAM P, Benzodiazepines P, Opiates P, Fentanyl P,
 - Blood, Peripheral:
 - Ethanol 0.13 gm/dL
 - Ecgonine Methyl Ester P<0.025 mg/L
 - Cocaine 0.060 mg/L
 - Cocaethylene 0.035 mg/L
 - Dihydrocodeine P<0.025 mg/L
 - Fentanyl 0.016 mg/L
 - Alprazolam 0.017 mg/L
 - Diltiazem P<0.025 mg/L
 - Methamphetamine 0.120 mg/L
 - Amphetamine 0.044 mg/L
 - Hydrocodone 0.070 mg/L
 - Morphine 0.006 mg/L

WHO HAS ACCESS TO THE STATE'S PRESCRIPTION DRUG MONITORING PROGRAM?

CAUSE OF DEATH			
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p> <p>IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Combined toxic effects of cocaine, fentanyl, and</p> <p>Due to (or as a consequence of)</p> <p>b. alprazolam, methamphetamine, hydrocodone, and</p> <p>Due to (or as a consequence of)</p> <p>c. heroin and ethanol</p> <p>Due to (or as a consequence of)</p> <p>d.</p> <p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>			<p>APPROXIMATE INTERVAL: Onset to Death</p>
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>			<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>			
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown</p>		<p>24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>	
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) Relative's home</p>	<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>			
<p>25f. DESCRIBE HOW INJURY OCCURRED: Decedent reportedly injected illicit drugs and prescription medications obtained from unknown source</p>			<p>25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)</p>

TOX DEATH #5 (THE CRASH)

- A 33 year old man was operating his motorcycle on Gadsden Highway when he was hit by a BMW. The decedent was stopped in the highway (it appeared he had stopped to make a left turn) and was struck from behind by the BMW. The driver of the vehicle did not leave the scene and was not impaired per Trussville PD. The driver did go to the hospital to submit blood and urine samples. The decedent's body was approximately 20 feet from the point of the collision and his helmet was found in the roadway near his motorcycle.
- External exam: Abrasions involving less than 5% of the TBSA; marked deformation of the decedent's head. **From the decedent's sock, two syringes were recovered in addition to a bag of clear crystalline material (0.3 grams).
- NO Autopsy: Postmortem radiographs revealed innumerable skull fractures and at least two cervical fractures.
- Tox results:
 - UDS: Amphetamines P
 - Blood, Peripheral:
 - Ethanol ND
 - Amphetamine: 0.154 mg/L
 - Methamphetamine >1.0 mg/L

CAUSE OF DEATH				APPROXIMATE INTERVAL: Onset to Death
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line</p>				
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death) →</p> <p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p>a. Blunt force injuries of head and neck</p> <p style="text-align: center; font-size: small;">Due to (or as a consequence of)</p> <p>b. Motorcycle – motor vehicle collision</p> <p style="text-align: center; font-size: small;">Due to (or as a consequence of)</p> <p>c. _____</p> <p style="text-align: center; font-size: small;">Due to (or as a consequence of)</p> <p>d. _____</p>			
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p> <p style="font-size: large; margin-left: 20px;">Methamphetamine use</p>				<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>				
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p>Yes Probably</p> <p>No Unknown</p>		<p>24. IF FEMALE:</p> <p><input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year</p> <p><input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>		
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area)</p> <p style="font-size: large; text-align: center;">Roadway</p>		<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>				
<p>25f. DESCRIBE HOW INJURY OCCURRED:</p> <p style="font-size: large;">Decedent was operating motorcycle and was hit by car while stopped in roadway.</p>				<p>25g. IF TRANSPORTATION INJURY, SPECIFY.</p> <p><input checked="" type="checkbox"/> Driver / Operator </p> <p><input type="checkbox"/> Passenger</p> <p><input type="checkbox"/> Pedestrian</p> <p><input type="checkbox"/> Other (Specify) _____</p>

TOX DEATH #6 (TRYING TO MAKE CHICKEN SALAD.....)

- UAB Palliative Care called to report a death. A 36 year old man was dropped off at the UAB ED by unknown persons who told the security guard that “our friend is not well and needs help.” The guard summoned medical staff and the individuals left the ED in a red SUV. The decedent was stabilized in the ED and a UDS was positive for opiates and benzodiazepines. The decedent was diagnosed with anoxic brain injury and transferred to the neurology ICU. After conversations with family members, the decedent was made DNR and transferred to Palliative Care. He died on hospital day 33.
- External exam: No evidence of injury unrelated to medical therapy.
- No autopsy was performed:
- Tox results:
 - **No antemortem blood sample is available for testing. Due to the decedent’s prolonged hospitalization, no additional toxicological testing was performed.

CAUSE OF DEATH			
20. PART I. Enter the <u>chain of events</u> —diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.			APPROXIMATE INTERVAL: Onset to Death
IMMEDIATE CAUSE (First disease or condition resulting in death)	a. <u>Probable opiate and benzodiazepine toxicity</u> Due to (or as a consequence of)		
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.	b. _____ Due to (or as a consequence of)		
	c. _____ Due to (or as a consequence of)		
	d. _____		
PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.		21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined			
23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown		24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death	
25a. DATE OF INJURY (Mo/Day/Yr)	25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM	25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <div style="font-size: 1.5em; text-align: center;">Unknown</div>	25d. INJURY AT WORK? Yes No
25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)			
25f. DESCRIBE HOW INJURY OCCURRED: <div style="font-size: 1.2em;">Brought to emergency room unresponsive by unknown persons and left; probable overdose; no admission blood sample to test.</div>			25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____

TOX DEATH #7 (WHEN I DON'T FOLLOW ALL THE RULES)

- The decedent was one of two individuals found dead in a hotel room (33 year old man). Syringes and needles were found in the room. The decedents were apparently traveling from out of state (ID cards indicated residences in Florida) and no next-of-kin is known.
- External exam: Needle puncture marks identified on the decedent's left ACF in addition to needle track marks on the decedent's forearm and the dorsal aspects of both feet.
- Autopsy: No evidence of injury within the body. Marked pulmonary congestion and edema; bladder dilated by clear urine.
- Tox results:
 - UDS: Fentanyl P, 6-Acetylmorphine P,
 - Blood, peripheral:

• Fentanyl	0.016 mg/L
• Acetyl fentanyl	P
• Carfentanil	P
• Morphine	0.044 mg/L
• Codeine (ARUP)	0.004 mg/L
• 6-Acetylmorphine (ARUP)	0.007 mg/L

CAUSE OF DEATH				APPROXIMATE INTERVAL: Onset to Death
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>				
<p>IMMEDIATE CAUSE (First disease or condition resulting in death) →</p> <p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p>a. <u>Fentanyl, acetyl fentanyl, carfentanil, and heroin toxicity</u></p> <p style="text-align: center;">Due to (or as a consequence of)</p> <p>b. _____</p> <p style="text-align: center;">Due to (or as a consequence of)</p> <p>c. _____</p> <p style="text-align: center;">Due to (or as a consequence of)</p> <p>d. _____</p>			
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>				<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural <input checked="" type="checkbox"/> Accident Suicide Homicide Pending Investigation Could not be determined</p>				
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p>Yes Probably No Unknown</p>		<p>24. IF FEMALE:</p> <p><input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year</p> <p><input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>		
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY</p> <p><input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area)</p> <p style="font-size: 1.2em; text-align: center;">Hotel room</p>		<p>25d. INJURY AT WORK?</p> <p>Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>				
<p>25f. DESCRIBE HOW INJURY OCCURRED:</p> <p style="font-size: 1.2em;">Decedent injected multiple illicit drugs obtained from unknown source.</p>				<p>25g. IF TRANSPORTATION INJURY, SPECIFY:</p> <p><input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>

TOX DEATH #8 (IT'S GOT TO PASS THE ACID TEST)

- A 42 year old man was found dead at his residence. Reportedly, the decedent was the suspect in a child abuse investigation and had indicated to family members he would not be going to jail. The decedent was found seated on a couch and three empty pill containers were on the table in front of the couch. The containers were for metoprolol, alprazolam, and sertraline (all active prescriptions for decedent).
- External exam: No evidence of trauma to explain death.
- Autopsy: Cardiomegaly with LVH (490 grams), some arterionephrosclerosis, and some pill fragments identified in stomach.
- Tox results:
 - UDS: Benzodiazepines P
 - Blood, peripheral:
 - Alprazolam 4.1 mg/L
 - Metoprolol 31 mg/L
 - Setraline P

CAUSE OF DEATH			
<p>20. PART I. Enter the <u>chain of events</u>—diseases, injuries, or complications—that directly caused the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line.</p>			<p>APPROXIMATE INTERVAL: Onset to Death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death) →</p>	<p style="font-size: 1.2em; text-align: center;">Alprazolam and metoprolol toxicity</p>		
<p>Sequitently list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.</p>	<p>a. _____ Due to (or as a consequence of)</p>		
	<p>b. _____ Due to (or as a consequence of)</p>		
	<p>c. _____ Due to (or as a consequence of)</p>		
	<p>d. _____</p>		
<p>PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>			<p>21a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
			<p>21b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>22. MANNER OF DEATH Natural Accident <input checked="" type="checkbox"/> Suicide Homicide Pending Investigation Could not be determined</p>			
<p>23. DID TOBACCO USE CONTRIBUTE TO DEATH? Yes Probably No Unknown</p>		<p>24. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within last year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death</p>	
<p>25a. DATE OF INJURY (Mo/Day/Yr)</p>	<p>25b. TIME OF INJURY <input type="checkbox"/> AM <input type="checkbox"/> PM</p>	<p>25c. PLACE OF INJURY (e.g. Decedent's home, construction site, restaurant, wooded area) <div style="font-size: 1.5em; text-align: center;">Residence</div></p>	<p>25d. INJURY AT WORK? Yes No</p>
<p>25e. LOCATION OF INJURY: (Number, Street, Apartment No., City, State, Zip Code)</p>			
<p>25f. DESCRIBE HOW INJURY OCCURRED: Ingested multiple doses of medication that had been prescribed to decedent</p>			<p>25g. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver / Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>

- Questions dwdye@uabmc.edu
- <http://www.jccal.org/Default.asp?ID=236>
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