

Cause-of-death certification: Not as easy as it seems

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Think you know how to fill out a death certificate? It's often not as easy as it seems. Try the following cases.

CASE 1

A 68-year-old woman is admitted to the ICU because of acute chest pain. She has a history of type 2 diabetes, hypertension, obesity, and angina. Over the next 24 hours an acute myocardial infarction is confirmed. Heart failure develops but improves with medical management. The patient then experiences a pulmonary embolus, confirmed by ventilation-perfusion lung scan and blood gases; over the next 2 hours she becomes unresponsive and dies.

Question: What should be written on the death certificate as the immediate and underlying cause of death? *Answer:* pulmonary embolus due to acute myocardial infarction due to atherosclerotic heart disease.

Question: What should be listed as conditions contributing to death but not directly causing death? *Answer:* type 2 diabetes, obesity, hypertension, and congestive heart failure.

CASE 2

A 78-year-old woman has left hemiparesis from a stroke 2 years earlier. She has been unable to care for herself and has lived in a nursing home. She has had an indwelling urinary catheter for the past 6 months. Because of fever, increased leukocyte count, and pyuria, she is admitted to the hospital and started on 2 antibiotics. Two days later, the blood culture result is positive for *Pseudomonas aeruginosa* resistant to the antibiotics being administered. Despite a change of antibiotics, hypotension ensues and the patient dies on hospital day 4.

Question: What should be written on the death certificate as the immediate and underlying cause of death? *Answer:* *P aeruginosa* sepsis, due to a urinary tract infection due to an indwelling catheter, due to left hemiparesis, due to an old cerebral infarction.

Question: What should be listed as conditions that contributed to the death but that did not directly cause the death? *Answer:* nothing.

If you were correct on both cases, congratulations. If you were not, this article offers basic advice that will help you provide accurate medical information on death certificates.

Death certificates are important official records used for personal, legal, and public

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TABLE 1

Definitions

Immediate cause of death: The final disease or injury causing the death.
Intermediate cause of death: A disease or condition that preceded and caused the immediate cause of death.
Underlying cause of death: A disease or condition present before, and leading to, the intermediate or immediate cause of death. It can be present for years before the death.
Manner of death: The circumstances leading to death—accident, homicide, suicide, unknown or undetermined, and natural causes.
Medical examiner: A physician, acting in an official capacity within a particular jurisdiction, charged with the investigation and examination of persons dying suddenly, unexpectedly, or violently, or whose death resulted from, or presents, a potential public health hazard. The medical examiner is not always required to be a specialist in death investigation or pathology. Most systems employing physicians as part time medical examiners encourage them to obtain training for medical examiners such as that offered by the National Association of Medical Examiners.
Coroner: A coroner is a public official, appointed or elected, in a particular geographic jurisdiction, whose official duty is to make inquiry into deaths in certain categories. In some jurisdictions, the coroner is a physician, but in many localities, the coroner is not required to be a physician nor be trained in medicine.
Pronouncing physician: The one who determines the decedent is legally dead. Not all states require a death to be pronounced by a physician.
Certifying physician: The one who certifies the cause of death.

health purposes, yet they are frequently filled out inaccurately. Physicians are responsible for determining the cause and manner of death, yet they are seldom formally trained for this responsibility in medical school or residency. The result is frequent and avoidable errors.

■ WHO IS RESPONSIBLE FOR WHAT?

Registration of deaths is a state responsibility. The National Center for Health Statistics compiles data from all states to produce national vital statistics, and most states use death certificate forms that conform to a recommended national standard. Though funeral directors are responsible for filing the certificate with the state, physicians are responsible for completing the medical portion of the certificate.

With the medical information provided, trained coders classify the cause of death using

standardized methodology.

Medical examiners or coroners are responsible for investigating and certifying the cause of any death that is unexpected, unexplained, or resulting from injury, poisoning, or a public health threat.

Physicians are additionally responsible for answering inquiries from the registrar (these inquiries can be reduced by accurately and completely filling in the medical information) and submitting a supplemental report when autopsy findings or other information indicates a cause of death different from that originally reported.

■ HOW TO COMPLETE THE MEDICAL PORTION OF THE DEATH CERTIFICATE

The **Figure** is a standard certificate of death. It may vary slightly state to state. Physicians are responsible for items 24 through 49. If the state

FIGURE

US standard death certificate

LOCAL FILE NO.		STATE FILE NO.			
1. DECEDENT'S LEGAL NAME (include AKA's if any) (First, Middle, Last) John Leonard Palmer		2. SEX Male	3. SOCIAL SECURITY NUMBER 123-45-6789		
4a. AGE—Last birthday (Years) 92	4b. UNDER 1 YEAR Months Days	4c. UNDER 1 DAY Hours Minutes	5. DATE OF BIRTH (Mo/Day/Yr) April 23, 1911	6. BIRTHPLACE (City and State or Foreign Country) San Francisco, CA	
7a. RESIDENCE—STATE Maryland		7b. COUNTY Frederick	7c. CITY OR TOWN Thurmont		
7d. STREET AND NUMBER 245 Lone View Road		7e. APT. NO.	7f. ZIP CODE 20212-1234	7g. INSIDE CITY LIMITS? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
8. EVER IN US ARMED FORCES? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9. MARITAL STATUS AT TIME OF DEATH <input checked="" type="checkbox"/> Married <input type="checkbox"/> Married, but Separated <input type="checkbox"/> Widowed <input type="checkbox"/> Divorced <input type="checkbox"/> Never Married <input type="checkbox"/> Unknown		10. SURVIVING SPOUSE'S NAME (if wife, give name prior to marriage) Sheila Marie Sonner	
11. FATHER'S NAME (First, Middle, Last) Stanley Leonard Palmer		12. MOTHER'S NAME PRIOR TO MARRIAGE (First, Middle, Last) Lorraine Ellen Russell			
13a. INFORMANT'S NAME Sheila Marie Palmer		13b. RELATIONSHIP TO DECEDENT Wife	13c. MAILING ADDRESS (Street and Number, City, State, Zip Code) 245 Lone View Road, Thurmont, MD 20212-1234		
IF DEATH OCCURRED IN A HOSPITAL: <input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> Emergency Room/Outpatient <input type="checkbox"/> Dead on Arrival		14. PLACE OF DEATH (Check only one; see instructions) IF DEATH OCCURRED SOMEWHERE OTHER THAN A HOSPITAL: <input type="checkbox"/> Hospice facility <input type="checkbox"/> Nursing home/Long-term care facility <input type="checkbox"/> Decedent's home <input type="checkbox"/> Other (Specify):			
15. FACILITY NAME Mountain Memorial Hospital		16. CITY OR TOWN, STATE, AND ZIP CODE Frederick		17. COUNTY OF DEATH Frederick	
18. METHOD OF DISPOSITION <input checked="" type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		19. PLACE OF DISPOSITION (Name of cemetery, crematory, other place) Wesley Memorial Cemetery			
20. LOCATION—CITY, TOWN, STATE Frederick		21. NAME AND COMPLETE ADDRESS OF FUNERAL FACILITY Boone and Sons Funeral Home, 475 E. Main St., Frederick, MD 20216-3456			
22. SIGNATURE OF FUNERAL SERVICE LICENSEE OR OTHER AGENT Robert J. Boone			23. LICENSE NUMBER 2569114		
ITEMS 24–28 MUST BE COMPLETED BY PERSON WHO PRONOUNCES OR CERTIFIES DEATH		24. DATE PRONOUNCED DEAD (Mo/Day/Yr) June 30, 2003		25. TIME PRONOUNCED DEAD 0310	
26. SIGNATURE OF PERSON PRONOUNCING DEATH (Only when applicable) Julia R. Kovar, MD		27. LICENSE NUMBER 624998075		28. DATE SIGNED (Mo/Day/Yr) June 20, 2003	
29. ACTUAL OR PRESUMED DATE OF DEATH (Mo/Day/Yr) (Spell month) June 20, 2003		30. ACTUAL OR PRESUMED TIME OF DEATH 0300		31. WAS MEDICAL EXAMINER OR CORONER CONTACTED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
CAUSE OF DEATH (See instructions and examples)					
32. 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 failure, or ventricular fibrillation without showing the etiology. DO NOT ABBREVIATE. Enter only one cause on a line. Add additional lines if necessary.					Approximate interval: Onset to death
IMMEDIATE CAUSE (Final disease or condition resulting in death)		a. Pulmonary embolism Due to (or as a consequence of):			Minutes _____
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. Congestive heart failure Due to (or as a consequence of):			4 days _____
		c. Acute myocardial infarction Due to (or as a consequence of):			7 days _____
		d. Chronic ischemic heart disease			8 years _____
33. PART II. Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I. Diabetes mellitus, Hypertension					33. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
					34. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
35. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown		36. IF FEMALE: <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnancy within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year prior to death <input type="checkbox"/> Unknown if pregnant within the past year		37. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	
38. DATE OF INJURY (Mo/Day/Yr) (Spell Month)		39. TIME OF INJURY		40. PLACE OF INJURY (EG, decedent's home, construction site, restaurant, wooded area) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
42. LOCATION OF INJURY: State Street and Number:		City or Town:		Apt No.: Zip Code:	
43. DESCRIBE HOW INJURY OCCURRED:				44. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)	
45. CERTIFIER (Check only one) <input type="checkbox"/> Certifying physician — To the best of my knowledge, death occurred to the cause(s) and manner above. <input type="checkbox"/> Pronouncing & certifying physician — To the best of my knowledge, death occurred at the time, date, and place, to the cause(s) and manner above. <input checked="" type="checkbox"/> Medical Examiner — On the basis of examination, and/or investigation, death occurred at the time, date, and place, to the cause(s) and manner above.					
Signature of certifier: Edward M. Stone, MD					

requires a pronouncing physician (**Table 1**), the pronouncing and certifying physicians may be different, in which case the pronouncing physician completes items 24 through 31 and the certifying physician items 32 through 49. If the pronouncing physician is also the certifying physician, items 26 through 28 need not be completed. If the death is referred to the coroner or medical examiner, they complete items 24, 25, 29, 30, and 32 through 49.

The most challenging part

Item 32, the Cause of Death, is the most difficult item to complete accurately. It consists of two parts. Part I is a sequential list of conditions leading to the immediate cause of death and the time interval between their onset and the death. Part II is a list of other conditions contributing to the death but not directly causing death. Thinking about the death as a sequence of events and reconstructing this sequence helps classify correctly the various illnesses and conditions the decedent might have had.

Immediate cause of death. Part I, line a, is for the immediate cause of death (see **Table 1**). This should be a disease, complication, or injury that directly caused the death. A common error is to list a mechanism of death (for example, cardiac arrest) rather than a disease (myocardial infarction).

Specific terms are better than vague ones. For instance, “cerebral infarction” is better than “stroke.” “*Escherichia coli* sepsis” is better than just “sepsis.”

When cancer is the cause of death, list the primary site, cell type, cancer grade, and specific organ or lobe affected.

Avoid terms without medical meaning, such as old age or senescence.

If additional information is expected from an autopsy, it is acceptable to list the cause of death as pending. But an update to certificate will be required once the additional information is obtained. It is also acceptable to list a cause as unknown. This will *not* automatically forward

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the case to the medical examiner.

Intermediate/underlying causes. Lines b, c, and d are for intermediate and underlying causes. Each condition listed should cause the one above it. You should be able to proceed logically from the underlying cause through each intermediate cause by saying the phrase “due to” or “as a consequence of,” moving from the lower line up through line b. There may be several intermediate causes. For example, a death may be due to a pulmonary embolus, as a consequence of hip surgery, resulting from an injury from a fall, resulting from a cerebral infarction. The underlying cause is the cerebral infarction.

Marking time intervals. To the right of lines a through d is space to write the time interval between the condition listed (immediate, intermediate, or underlying cause of death) and the time of death. The more precise the time the better. But it is understood that times must occasionally be estimated, and terms such as “approximately” are acceptable. If the time cannot be estimated, insert the phrase “unknown duration.” Something should be listed on this line next to the immediate, intermediate, and underlying conditions listed. No lines should be left blank.

Other illnesses. Part II is where to list other significant illnesses or conditions that may have contributed to the death but were not the direct causes of it. More than one condition may be listed. Many patients have multiple conditions and there may be uncertainty as to direct and contributing causes of the death. The physician is only expected to make the best judgment possible as to the most likely causes and sequences. Coders referring to international standards and rules will use the information to make a final classification of the underlying cause.

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TABLE 2

Important points to remember when completing medical information on a death certificate

Do not use abbreviations.
Do not use numbers for months; spell out the month.
Use a 24-hour clock (1600, not 4 P.M.).
Do not alter the document or erase any part of it.
Print legibly using black ink.
Complete all required items, do not leave them blank. If necessary, write "unknown."
Do not delay completing the certification. The burial or other disposition of the remains depends on the correct completion of the certificate and its acceptance by the state or local registrar.
Do not complete the medical information if another physician has more knowledge of the circumstances, unless they are unavailable.

■ **SPECIFIC ERRORS TO AVOID**

Table 2 includes some points to remember to avoid making errors when filling out the death certificate medical information. By following these rules, studying the cases provided in the *Physicians' Handbook on Medical Certification and Death*, and systematically thinking about the sequence of events that caused the death, physicians can improve on their accuracy when performing the important and under appreciated role of accurately certifying the medical cause of death.

■ **USEFUL RESOURCES**

The *Physicians' Handbook on Medical Certification of Death*, published by the Centers for Disease Control, National Center for Health Statistics, is available at www.cdc.gov/nchs/data/misc/hb_cod.pdf. It contains instructions on how to complete a death certificate and a series of useful examples that take about a half hour to review.