Writing Cause of Death Statements-Basic Principles

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This is an example of a POORLY WRITTEN cause-of-death statement which, unfortunately, is typical of many death certificates that are completed by physicians.
Part I
A. Septic shock Due to, or as a consequence of:
B. Gram-negative sepsis Due to, or as a consequence of:
C. One must immediately ask "Why did this patient have gram-negative sepsis?-- that's not something that most healthy people get, and spontaneous occurrence must be extremely rare."
The truth is that the patient had multiple sclerosis and a chronic indwelling catheter for a neurogenic bladder, which resulted in the the urinary tract infection. An accurate and complete cause-of-death statement is:
Part I
A. Gram-negative pseudomonas sepsis Due to, or as a consequence of:
B. Urinary bladder infection Due to, or as a consequence of:
C. Indwelling catheter for neurogenic bladder Due to, or as a consequence of:
D. Multiple sclerosis This example is much more informative and of greater potential use than the preceding example. It tells the specific story and sequence of events that led to this patient's death. The cause-of-death information from each death YOU certify is coded and becomes part of our state and national mortality data base maintained by the National Center for Health Statistics.
Part I
A. Cardiac tamponade Due to, or as a consequence of:
B. Myocardial infarction with left ventricular rupture Due to, or as a consequence of:
C. Atherosclerotic coronary artery disease It is, therefore, important that YOU make every effort to complete each death certificate as accurately and completely as possible. The quality of our mortality data bases depends on it. You can see that this cause-of-death statement provides complete information, and compared with the example on Screen 2, is of greater potential use for research, statistics, public health decision making and policy setting, and law-making. It also provides complete information for the family and others who use the death certificate. The rest of this tutorial will present general principles for writing cause-of-death statements so YOUR contribution to national mortality statistics, and to all people who use the death certificate or information derived from it, will be the best it can be.
There is documentation in the medical literature that death certificate information has limitations which are sometimes considerable. A significant factor is that few physicians receive formal in medical school or postgraduate training programs about completion of the death certificate. Often, a physician's first encounter with the death certificate occurs upon the physician's first patient death when the physician is handed the death certificate form and is asked to complete it. Therefore, information provided on death certificates is frequently incomplete-- like the first example (Screen 2) in this tutorial.
Hopefully, this tutorial will help you avoid mistakes and to be complete and accurate when writing cause-of-death statements. The cause-of- death statement contains two parts, appropriately named Part I and Part II.
Part I
A. Due to, or as a consequence of:
B. Due to, or as a consequence of:
C. Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I
Part I is designed so that a sequence of conditions leading to death may be reported. Part II is for reporting conditions that pre-existed or co-existed and contributed to death, but did not result in the the cause reported in Part I. Part I will be considered first. It is formatted so that sequential information is reported with ONE CONDITION per line, starting with the most recent condition on the top line and going backward in time on progressively lower lines.
Part I
A. Most recent condition (e.g., Cardiac tamponade) Due to, or as a consequence of:
B. Next oldest condition (e.g., Ruptured myocardial infarction) Due to, or as a consequence of:
C. Oldest (original, initiating) condition (e.g., Atherosclerotic coronary artery disease) Each condition can cause the one on the line above it. It is not always necessary to use all of the lines in Part I. Most states have either 3 or 4 lines on their death certificate. Although rarely needed, extra lines may be added. The top line (A) should always be used. In this example, floppy mitral valve syndrome is the underlying cause of death-- the specific condition (disease or injury) that started the downhill course of events that led to death.
Part I
A. Cerebral infarction Due to, or as a consequence of:
B. Thrombo-embolism to right internal carotid artery Due to, or as a consequence of:
C. Thrombo-embolism from bacterial endocarditis of mitral valve Due to, or as a consequence of:
D. Floppy mitral valve syndrome A major goal when writing a cause-of-death statement is to report an underlying cause of death that is as etiologically specific as possible based on current medical knowledge. To-date, there is no known, reportable cause of floppy mitral valve syndrome, thus, it is a "competent" underlying cause of death. In the example below, "atherosclerotic coronary artery disease" is the underlying cause of death.
Part I
A. Acute myocardial infarction Due to, or as a consequence of:

B. Atherosclerotic coronary artery disease Due to, or as a consequence of:
C. It is also valuable to report the complications of the underlying cause of death. In the example, "acute myocardial infarction" was the final and fatal complication of the coronary artery disease and is the immediate cause of death-- the final condition that was a complication of the underlying cause of death and which directly culminated in death. Note that in this case, only two lines were needed to complete the cause-of-death statement. You can see the value of reporting the atherosclerotic coronary artery disease as the underlying cause of death because there are a number of conditions that may cause acute myocardial infarction.
Part I
A. Acute myocardial infarction Due to, or as a consequence of:
B. Atherosclerotic coronary artery disease Due to, or as a consequence of:
C. Examples of other possible causes of acute myocardial infarction include coronary artery vasculitis, trauma, coronary artery anomalies, embolism from other diseases at other sites, and other conditions. If only the acute myocardial infarction were reported, a user of the cause-of-death statement would not know which underlying condition existed in the patient. This example tells us that in this patient, it was coronary artery atherosclerosis that caused the acute myocardial infarction. As mentioned, it may be necessary to use three or more lines in Part I.
Part I
A. Upper gastrointestinal hemorrhage Due to, or as a consequence of:
B. Ruptured esophageal varices Due to, or as a consequence of:
C. Cirrhosis of the liver Due to, or as a consequence of:
D. Chronic alcohol abuse In the example, "chronic alcohol abuse" is the underlying cause of death. "Upper gastrointestinal hemorrhage" is the immediate cause of death. Each of the other two conditions is an intermediate cause of death because it falls somewhere in the sequence between the underlying and immediate cause of death. This example shows a "Sequential Part I Format" because more than one line is used in Part I.
It may not always be possible to report an immediate cause of death.
Consider a 60 year-old man who had widely metastatic, terminal prostate carcinoma, whose death was expected, and who died at home. Permission for autopsy could not be obtained. It might be necessary to write the cause-of-death statement as:
Part I
A. Metastatic adenocarcinoma of the prostate Due to, or as a consequence of:
B. Due to, or as a consequence of:
C. Insufficient information existed to cite an immediate cause-of-death such as pneumonia, midbrain metastasis, or some other cause. In cases such as this one, Line A serves as both the underlying and immediate cause of death, and when only Line A is used, a "Single Line Part I Format" has been used.
It is permissible to express uncertainty or presumption. One may qualify the cause-of-death statement with words such as "probable" or "presumed."
Part I
A. Acute myocardial infarction Due to, or as a consequence of:
B. Probable coronary artery atherosclerosis Due to, or as a consequence of:
C. Due to, or as a consequence of:
D. In general, one need not use such terms because the cause-of-death statement is an opinion based on all available information and need only meet the test of being "more likely than not." There are situations, however, where the inclusion of such wording may be helpful to indicate some degree of uncertainty.
Patients usually die of fatal nonspecific processes (complications of the underlying cause of death) such as gastrointestinal hemorrhage. In some cases, there may have been insufficient time to evaluate or fully diagnose the patient, or inability to obtain permission for autopsy. In such cases, this approach may be used:
Part I
A. Gastrointestinal hemorrhage Due to, or as a consequence of:
B. Undetermined natural causes Due to, or as a consequence of:
C. Of course, one should be reasonably certain that only natural causes were involved and that there is no other reasonably probable underlying cause of death. Using such an approach lets a user of the cause-of-death statement know that thought was given about the underlying cause of death and it wasn't just omitted through oversight.
Using the same scenario as on the previous screen (Screen 14), but adding that the patient had symptoms and signs strongly pointing to peptic ulcer disease as the cause of the gastrointestinal hemorrhage, it would be preferable to write the cause-of-death statement as:
Part I
A. Gastrointestinal hemorrhage Due to, or as a consequence of:
B. Probable peptic ulcer disease Due to, or as a consequence of:
C. Medical judgment is required when picking the best alternative for writing the cause-of-death statement. Truthfulness, completeness, and reasonable accuracy should be the goal-convenience and expedience should not play a role when deciding upon a cause-of-death statement.
So far, each of the examples has involved only a single underlying disease entity. But what if more than one condition (disease or injury) seemed temporally inseparable or to have added together to cause death?
Part I
A. Due to, or as a consequence of:
B. Due to, or as a consequence of:

C. Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Such cases are why Part II exists for citing "Other Significant Conditions." Part II may be used to report conditions that co-existed or pre-existed and contributed to death but did not result in the underlying cause of death reported in Part I.

The case below is a classic example of the intended use of Part II.

Part I

A. Acute myocardial infarction Due to, or as a consequence of:

B. Atherosclerotic coronary artery disease Due to, or as a consequence of:

C. Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Essential hypertension Assume that the patient had a clinical course strongly pointing to coronary atherosclerosis with acute myocardial infarction. However, the patient also had hypertension which was thought to have been partially responsible for cardiomegaly which increased cardiac oxygen demand and facilitated the adverse effects of the coronary artery disease. The hypertension co-existed and contributed to death, but did not cause the underlying cause of death in Part I. Hypertension, then, is correctly reported in Part II as an other significant condition.

Part II can also be used another way. Consider a patient with AIDS who dies with complications including pneumocystis carinii pneumonia and disseminated mycobacterium avium complex-- clinically, the pneumocystis pneumonia seemed the most significant in causing terminal pulmonary problems:

Part I

A. Pneumocystis carinii pneumonia Due to, or as a consequence of:

B. Acquired immune deficiency syndrome Due to, or as a consequence of:

C. Human immunodeficiency virus infection Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Disseminated mycobacterium avium infection To facilitate coding, only 1 condition should be reported per line in Part I. The most important condition should be cited in Part I and the lesser important one(s) should be cited in Part II, as shown here.

Note that this example fits nicely with the intended use of Part II.

Part I

A. Pneumocystis carinii pneumonia Due to, or as a consequence of:

B. Acquired immune deficiency syndrome Due to, or as a consequence of:

C. Human immunodeficiency virus infection Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Disseminated mycobacterium avium infection The disseminated mycobacterium infection did contribute to death. Although it resulted from the underlying cause of death reported in Part I, it did not result in the underlying cause of death. More than one condition may be reported in Part II, and it is often necessary to do so.

A third way to use Part II is for reporting risk factors. For example, the cause-of-death statement for a man who was a heavy cigarette smoker and who died of Klebsiella pneumonia as a complication of emphysema may be written as:

Part I

A. Community-acquired Klebsiella pneumonia Due to, or as a consequence of:

B. Emphysema Due to, or as a consequence of:

C. Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Cigarette smoking One might argue that this is NOT an appropriate use of Part II because the cigarette smoking caused the emphysema listed in Part I. In a specific case, however, it may be difficult to know that a cause-and-effect relation existed. Thus, this method may be used as a matter of convention (general agreement).

The same method of reporting risk factors may be used for other risk factors (such as obesity, alcohol intoxication, intravenous drug abuse etc.) that existed in the patient and is relevant to the cause-of-death sequence reported in Part I.

Part I

A. Cerebral toxoplasmosis Due to, or as a consequence of:

B. Acquired immune deficiency syndrome Due to, or as a consequence of:

C. Human immunodeficiency virus infection Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Intravenous drug abuse It is not necessary to include the words "risk factor," but doing so does clarify the nature of the reported condition. Also, some states require the reporting of selected conditions (such as recent pregnancy, neoplasms) in Part II even if they did not contribute to death. Familiarity with local regulations is essential.

It sometimes seems that there are so many conditions to pick from that selecting the few important ones for reporting in the cause-of-death statement is difficult. There are some Principles that may be followed, however, to assist in the process:

Principles

1. Make every effort to report an etiologically specific underlying cause of death.
2. Try to use a Sequential Part I Format, if possible.
3. Err on the side of reporting too much rather than too little.
4. DO NOT report mechanistic terminal events such as:
 - cardiac arrest
 - asystole

- cardiopulmonary arrest
- respiratory arrest
- electromechanical dissociation
- ventricular fibrillation5. DO NOT report symptoms or signs.

6. DO NOT report a condition if its existence in the patient is obvious based on another reported condition.
7. DO NOT oversimplify
8. DO NOT use abbreviations

Using the Principle shown on Screen 22, a scenario may be used to illustrate their application. Scenario: A chronic alcoholic developed cirrhosis, jaundice, ascites, portal-systemic shunt, caput medusae, hyperammonemia, asterixis, hepatic encephalopathy, and then respiratory arrest followed by cardiac arrest and death.
The conditions are listed in approximate sequence from most recent to the oldest, and the conditions to remain for writing the cause-of death statement are determined by applying the Principles:
BEFORE APPLYING THE PRINCIPLES:
cardiac arrest
respiratory arrest
hepatic encephalopathy
asterixis
hyperammonemia
caput medusae
portal-systemic shunt
ascites
jaundice
cirrhosis
chronic alcohol abuse
AFTER APPLYING THE PRINCIPLES:
hepatic encephalopathy

cirrhosis
chronic alcohol abuse

The next screen discusses the rationale for eliminating or retaining the various conditions.
BEFORE:
cardiac arrest
respiratory arrest
hepatic encephalopathy
asterixis
hyperammonemia
caput medusae
portal-systemic shunt
ascites
jaundice
cirrhosis
chronic alcohol abuse
AFTER:
hepatic encephalopathy

cirrhosis
chronic alcohol abuse

Rationale: Cardiac arrest and respiratory arrest are mechanistic terminal events. Asterixis, caput medusae, ascites, and jaundice in this case were either symptoms or signs. Hyperammonemia is just one component of a complex process, and to cite it would be oversimplification. Chronic alcohol abuse was retained because it was the underlying cause of death. Cirrhosis and hepatic encephalopathy remain, are major conditions in the sequence that led to death, and enable the use of a Sequential Part I format. Portal-systemic shunt was eliminated because its existence seemed apparent based on the other reported conditions, although it could have been retained to err on the side of reporting too much rather than too little. Now, the cause-of-death statement is easily written as shown on the following screen.

By using the Principles, the following cause-of-death statement may be written:
Part I
A. Hepatic encephalopathy Due to, or as a consequence of:
B. Cirrhosis of the liver Due to, or as a consequence of:
C. Chronic alcohol abuse Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

The cause-of-death statement tells a complete story about how this patient died compared to how someone else may have died of the same underlying cause of death. In other words, not all patients with hepatic encephalopathy have cirrhosis, and not all patients with cirrhosis acquired it from chronic alcohol abuse.

Finally, Part I also contains space on each line to indicate the interval between the onset of each condition cited and death. These intervals should be stated as accurately as possible and without guessing. It should be apparent that the intervals should get longer (or at least not get shorter) as one reads from top to bottom. The interval since diagnosis should NOT be stated if a condition is known to have existed for a longer period of time. Generic intervals such as "seconds," "minutes," "hours," "days," "weeks," "months," "years," and "decades" are acceptable when needed. "Unknown" is also acceptable if such is the case and generic intervals cannot be accurately used. Intervals may also be approximate.
Part I
A. Intracerebral hemorrhage Interval between onset and death
Approx. 8 hours Due to, or as a consequence of:
B. Essential hypertension Interval between onset and death
10-15 years Due to, or as a consequence of:
C.
Interval between onset and death

Now you can try your hand at writing a cause-of-death statement. Below is a case scenario. Read it, and then take a few minutes to develop a cause-of-death statement.
The Senario: A 72 year old woman had a 20 year history of adult-onset (type II) diabetes mellitus for which insulin had been required for about 3 years. 5 years previously she had a "stroke" (cerebral infarction) which left her bed-ridden and dependent on long-term care. Work-up at that time showed carotid bruits and marked occlusion of the carotid arteries by atherosclerosis. After her stroke, she developed decubiti which became infected with proteus mirabilis , leading to septic shock and death.
Now.....On some scratch paper, try to complete a cause-of-death statement for this scenario. Then, compare yours with the one on the next screen (Screen 28).

Here is one acceptable way you may have written the cause-of-death statement for the scenario given on Screen 27:
Part I
A. Proteus mirabilis infection of decubitus ulcers Due to, or as a consequence of:
B. Complications of remote cerebral infarction Due to, or as a consequence of:
C. Carotid artery atherosclerosis Part II. OTHER SIGNIFICANT CONDITIONS: Conditions contributing to death but not resulting in the underlying cause of death in Part I

Type II Diabetes mellitus Remember, there is often more than one acceptable way to write a cause-of-death statement for a given death scenario. If yours is similar to this one, its probably okay, especially if you included the correct underlying cause of death, the immediate cause of death, and the diabetes shown in Part II (see next screen).

For the scenerio on Screen 28, diabetes was listed in Part II because it is a risk factor for atherosclerosis, and, it was felt to predispose the patient to the development of soft tissue infections.
Further resources:
The National Center for Health Statistics (NCHS) has educational materials regarding completion of the death certificate, including manuals and laminated instruction cards. These materials may be ordered by calling (301)436-8815.
The College of American Pathologists (CAP) has published Medical Cause of Death Manual: instructions for writing cause-of-death statements for deaths due to natural causes. A second manual titled Cause-of-Death Statements and Certification of Natural and Unnatural Deaths has also been published and contains tips of death certifications for many types of deaths. These manuals may be purchased by calling CAP Publications at 1-800-323-4040, extension 7531. These manuals contain many examples and addresses commonly encountered problems with writing cause-of-death statements. Your state vital records registrar may also have useful educational materials, particularly in regard to state-specific policies and procedures.
Thank you for trying this tutorial. Please feel free to share it with you colleagues.