Cause of Death Worksheets

The following are ten worksheets to help you practice the six steps required for consistent coding. The answer keys are located at the end. Try not to look at the answers until you have completely finished. If you have any questions or concerns, please do not hesitate to contact us at MDSlearn@smh.ca.

A Reminder of the Six Steps:

1. Carefully read past medical history & narrative
2. Highlight cardinal symptoms & negative evidence. Note keywords
3. Think of chronological sequence. Adhere to cardinal symptoms & negative evidences. Do not imagine facts which are not in the record
4. Choose underlying cause of death. Select specific ICD code & confirm against guidelines
5. Reconsider ICD code using differential diagnoses
6. Select certainty of diagnosis & quality of narrative

Notes:

Exercise 1: Female, 60 years old

Respondent thought person died of "diabetes / sugar disease". According to the respondent, the deceased woman was suffering from diabetes for last 8 years and was regular medication. She was having increased thirst, urination, appetite and weight gain. She developed stroke and paralysis of left side of body in last month. Her BP was raised and she lost consciousness and control over speech and micturation. She was discharged from hospital in coma and passed away in home.

Items in RHIME questionnaire include:

√ Hypertension
√ Heart disease
√ Stroke
√ Diabetes

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 2: Male (inferred from narrative), 83 years old

Respondent thought person died of "asthma". According to the respondent, the deceased man was suffering from asthma for last 6 years and was regular medication. He was having breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days. He was taken to physician who advised antibiotics and pumping medicine (inhalers). The medicines did not work and he passed away.

Items in RHIME questionnaire include:

√ Asthma

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 3: Female, 63 years old

Respondent thought person died of "stomach cancer". According to the respondent, the deceased woman was suffering from Stomach pain on and off for last 1 and half years and was regular medication. She was having loss of weight and appetite. She was hypertensive too. She passed away.

Items in RHIME questionnaire include:

√ Cancer

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 6: _____

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Exercise 4: Male, 65 years old

Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive and asthmatic and was regular unani medication. He developed severe headache, vomiting, fainting and bleeding. He passed away on road. He was weak and had loss of appetite.

Items in RHIME questionnaire include:

√ Hypertension

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 5: Male, 19 years old

Respondent thought person died of "fits". The patient died due to sudden fits. This was caused by nervous weakness, mental disturbance, physical weakness and constant high fever.

Items in RHIME questionnaire include:

√ Other chronic illness

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 6: Male, 25 years old

Respondent thought patient died of "lung cancer". Patient had an attack of cough with sputum. Sputum was mixed with blood. Patient had also history of chest pain. Pain was worse with cough and associated with fever and weight loss. Patient felt difficulty in breathing. Patient consulted doctors, was admitted in hospital and then died.

Items in RHIME questionnaire include:

√ Asthma

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 6: _____

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Exercise 7: Male, 22 years old

Respondent thought patient died of "diarrhoea" and "vomiting". According to the respondent's statement the deceased suffered with continuous fever associated with diarrhoea and vomiting for around one week. Fever rose every day. He was admitted to hospital and died after three days.

Items in RHIME questionnaire include:

√ Other chronic disease

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 8: Male, 53 years old

Respondent thought patient died of "stomach pain". The deceased had had pain in the stomach accompanied by a burning sensation since six months. He just took rice and dal only. He had a regular check up in the hospital for nearly 15 days. Since a month, he had started to vomit after every meal. The deceased had become very weak at the time of death. He died in his home.

Items in RHIME questionnaire include:

√ Nil significant

Step 1: _____

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Step 3: _____

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Step 5: _____

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Step 6: _____

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Exercise 9: Male, 58 years old

Respondent thought patient died of "sugar ki beemari". He felt weakness. He was frequently passing urine. His mouth and tongue was automatically becoming dry. He was feeling pain in his knees. He was day by day becoming thin. Took him to [the doctor]. He, upon examining the patient, declared that the patient is sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then was took the patient to the hospital. They performed some tests and told us that the patient is diabetic. They prescribed medicines. He took these medicines but of no use. Brought him to hospital for 10 days, where doctors performed some tests. They too confirmed diabetes and prescribed some medicines and restrictions on food, etc. Taken for treatment but there was no change. His condition worsened and ultimately he passed away.

Items in RHIME questionnaire include:

√ Diabetes

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Exercise 10: Female, 83 years old

Respondent thought patient died of "heart attack" and "old age". As reported by the respondent, the deceased was in old age and suffering from hypertension disease. She was under the treatment of several doctors. She has given high drugs but she could not tolerate these drugs. She was also involved by cough of long duration of more than six years. She spent sleepless night due to cough. Blood pressure remains higher than normal in various periods. Fever rose many days. Pain remains in aches more than 24 hours. Spread pain up to left arm and deep central chest. Due to cough she was associated with breathlessness, reduced urine amount also, burning with urine. Sometimes she fell unconscious. She fell seriously ill and could not talk. Due to high BP she passed away.

Items in RHIME questionnaire include:

√ Hypertension
√ Heart disease
√ Diabetes
√ Asthma

Step 1: _____

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Step 2: _____

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Step 3: _____

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Step 4: _____

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Step 5: _____

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Step 6: _____

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Answer 1: Female, 60 years old
Respondent thought person died of "diabetes / sugar disease". According to the respondent, the deceased woman was suffering from diabetes for last 8 years and was regular medication. She was having increased thirst, urination, appetite and weight gain. She developed stroke and paralysis of left side of body in last month. Her BP was raised and she lost consciousness and control over speech and micturation. She was discharged from hospital in coma and passed away in home.

Step 1: Relevant past history noted and narrative carefully read

Step 2: Keywords: "increased thirst, increased urination, increased appetite and weight gain", "diabetes for last 8 years and was regular medication", "BP high", "stroke and paralysis of left side of body in last month", "lost consciousness and control over speech and micturation"

Step 3: Chronology:

Stroke
↑
High BP

Step 4: CoD is stroke/ cerebro-vascular accident (CVA) (I64)
Keywords that match the guidelines are bolded:
Sudden onset of paralysis of one or more limbs in the month preceding death *AND any of the following:*

- ***Unconsciousness***
- *Loss of vision*
- ***Urinary incontinence***
- *Loss of sensations on any part of body*
- ***Altered speech***
- *Sudden onset of headache with altered sensorium*
- *Late onset of convulsions*

AND No previous episodes of convulsions

Step 5: Consider differential diagnoses: epilepsy (G40-G41), meningitis/encephalitis (G00-G09, A81-89), malaria (B50-B54), ischemic heart disease (I20-I25) and falls (W00-W19).

No history of convulsions rules out epilepsy (G40-G41). No history of fever and/or convulsions and/or neck stiffness rules out meningitis/encephalitis (G00-G09, A81-89) and malaria (B50-B54). No history of chest pain rules out Ischemic heart disease (I20-I25). No history of falls rules out falls (W00-W19)

Step 6: In this case, the certainty of diagnosis should probably be a 1-High as clearly indicative narrative. Quality of narrative is 1-Good.

Answer 2: Male (inferred from narrative), 83 years old
Respondent thought person died of "asthma". According to the respondent, the deceased man was suffering from Asthma for last 6 years and was regular medication. He was having breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days. He was taken to physician who advised antibiotics and pumping medicine (inhalers). The medicines did not work and he passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "suffering from asthma for last 6 years and was regular medication", "breathlessness, chest pain and hoarseness of voice and decreased intake of meals and weakness for last 4-5 days", "taken to physician who advised antibiotics and pumping medicine (inhalers)", "medicines did not work" and items from RHIME questionnaire.

Step 3: Chronology:

Exacerbation of asthma (not responding to medicines)
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Asthma

Step 4: CoD is asthma (J45).
Keywords that match the guidelines are bolded:
*Cough (with early wheezing- **hoarseness of voice**) off and on for long period (> 6 months duration) AND any of the following signs or symptoms:*

- ***Shortness of breath, especially at night or during change of season***
- *Wheezing relieved by bronchodilators*
- *Family history of similar illness*
- *AND None of the following:*
- ***Weight loss***
- ***Mild fever with evening rise***

Step 5: Consider differential diagnoses: tuberculosis (A15-A16), lower respiratory tract infection (J09-J22), lung cancer (C33-C34), ischemic heart disease (I20-I25), heart failure (I50)

No history of fever and/or haemoptysis and /or weight loss rules out tuberculosis (A15-A16), lower respiratory tract infection (J09-J22) and lung cancer (C33-C34). No history of classical chest pain with radiation to left hand or left side rules out ischemic heart disease (I20-I25). No history of swelling over feet and abdomen rules out heart failure (I50)

Step 6: In this case, the certainty of diagnosis should probably be a 1-High as clearly indicative narrative. Quality of narrative is 1-Good.

Answer 3: Female, 63 years old
Respondent thought person died of "stomach cancer". According to the respondent, the deceased woman was suffering from stomach pain on and off for last 1 and half years and was regular medication. She was having loss of weight and appetite. She was hypertensive too. She passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "suffering from stomach pain on and off for last 1 and half years and was regular medication", "loss of weight and appetite", "hypertensive" and items from RHIME questionnaire.

Step 3: Chronology:

Abdominal cancer (associated with loss of weight and appetite)

Step 4: CoD is abdominal cancer (C16).
Keywords that match the guidelines are bolded:
Vomiting/ vomiting of blood. Difficulty in swallowing AND Mass in upper abdomen AND any of the following:

- ***Pain in abdomen***
- ***Weight loss***
- *Enlarged liver*
- *Black stools*

OR diagnosed as stomach cancer
Possibly with history of repeated course of anti-ulcer drugs

Step 5: Consider differential diagnoses: peptic ulcers (K25-K29).

However, no long duration history of stomach pain and /or weigh loss ranks peptic ulcers (K25-K29) in far second place.

Step 6: In this case, the certainty of diagnosis should probably be a 2-Low as it does not match precisely with guidelines. Quality of narrative is 2-Poor (inadequate, could be improved).

Answer 4: Male, 65 years old
Respondent thought person died of "brain haemorrhage". According to the respondent, the deceased man was hypertensive and asthmatic and was regular unani medication. He developed severe headache, vomiting, fainting and bleeding. He passed away on road. He was weak and had loss of appetite.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "severe headache, vomiting, fainting and bleeding", "loss of appetite and weakness", "Hypertensive and asthmatic on regular unani medication" and items from RHIME questionnaire.

Step 3: Chronology:

Stroke
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Hypertension

Step 4: CoD is stroke / cerebro-vascular accident (CVA) (I64).
Keywords that match the guidelines are bolded:
Sudden onset of paralysis of one or more limbs in the month preceding death AND any of the following:

- ***Unconsciousness***
- *Loss of vision*
- *Urinary incontinence*
- *Loss of sensations on any part of body*
- *Altered speech*
- ***Sudden onset of headache with altered sensorium***
- *Late onset of convulsions*

AND ***no previous episodes of convulsions***

Step 5: Consider differential diagnoses: epilepsy (G40-G41), meningitis/encephalitis (G00-G09, A81-89), malaria (B50-B54), ischemic heart disease (I20-I25), falls (W00-W19)

No history of convulsions rules out epilepsy (G40-G41). No history of fever and/or convulsions and/or neck stiffness rules out Meningitis/Encephalitis (G00-G09, A81-89) and malaria (B50-B54). No history of chest pain rules out ischemic heart disease (I20-I25). No history of falls rules out falls (W00-W19)

Step 6: In this case, the certainty of diagnosis should probably be a 2-Low as it does not match precisely with guidelines. Quality of narrative is 2-Poor (could be inadequate).

Answer 5: Male, 19 years old
Respondent thought person died of "fits". The patient died due to sudden fits. This was caused by nervous weakness, mental disturbance, physical weakness and constant high fever.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "fits", "caused by constant high fever", "sudden" and items from RHIME questionnaire

Step 3: Chronology:

Fits

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High Fever

Step 4: CoD is acute CNS infection (G00).
Keywords that match the guidelines are bolded:

- *Continuous **fever until death** AND Neck stiffness, Vomiting*
- *Possibly with Loss of consciousness OR **No symptoms of ARI, diarrhoea** OR Photophobia*

Step 5: Consider differential diagnoses: viral meningitis (A81-A89), acute bacterial sepsis (A39-A41), typhoid (A01) or respiratory infections (J00-J22). Microbiologic diagnosis not possible on verbal autopsy without test results, ruling out meningitis. Death was earlier than that usually noted in typhoid (where it is usually in the 2nd or 3rd week). No respiratory symptoms were noted.

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 1-Good

Answer 6: Male, 25 years old
Respondent thought patient died of "lung cancer". Patient had an attack of cough with sputum. Sputum was mixed with blood. Patient had also history of chest pain. Pain was worse with cough and associated with evening fever and weight loss. Patient felt difficulty in breathing. Patient consulted doctors, was admitted in hospital and then died.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "cough", "sputum with blood", "chest pain", "fever", "weight loss", "breathlessness" and items from RHIME questionnaire

Step 3: Chronology:

Pulmonary Tuberculosis

Step 4: CoD is pulmonary tuberculosis (A16).
Keywords that match the guidelines are bolded:
Chronic cough of long duration with fever *AND any one of the following signs or symptoms:*

- ***Evening rise in fever***
- ***Blood in sputum***
- ***Chest pain***
- ***Breathlessness***
- *Loss of appetite*
- ***Chronic weight loss***

OR family history of diagnosed TB

Step 5: Consider differential diagnoses: airway cancer (C39)
This is also an option but as he was a young patient it has a low probability. History of fever also makes it unlikely. Probably admitted to a 'CD (communicable disease) hospital' and treated.

Step 6: In this case, the certainty of diagnosis is 1-High (based on clinical judgment even though diagnostic confirmation or treatment history not available). Quality of narrative is 2-Poor.

Answer 7: male, 22 years old
According to the respondent's statement the deceased suffered with continuous fever associated with diarrhoea and vomiting for around one week. Fever rose every day. He was admitted to hospital and died after three days.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "continuous fever", "diarrhoea & vomiting – all for more than 1 week", "fever rose each day", "died in 2nd week" and items from RHIME questionnaire

Step 3: Chronology:

Typhoid Fever

Step 4: CoD is typhoid fever (A01).
Keywords that match the guidelines are bolded:
Continuous, long duration high fever progressively increasing (Step ladder) *AND tongue highly coated AND any of the following:*

- *Severe headache*
- *Abdominal pain / distension or constipation*
- ***Death occurred in 2nd or 3rd week***
- *Delirium*
- *Blood in stool*

Step 5: Consider differential diagnoses: pneumonia (J18-22); malaria (B50-54); meningitis/encephalitis (A81-89, G00-09); gastroenteritis (A09)

No history of cough or fast-breathing rules out pneumonia (J18-22). No history of chills or rigors or other complications rules out malaria (B50-54). No history of specific symptoms rules out meningitis/encephalitis (A81-89, G00-09) and gastroenteritis (A09).

Primary symptom was fever that was rising each day & resulting in death in 2nd week

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 1-Good.

Answer 8: Male, 53 years old
Respondent thought patient died of "stomach pain". The deceased had had pain in the stomach accompanied by a burning sensation since six months. He just took rice and dal only. He had a regular check up in the hospital for nearly 15 days. Since a month, he had started to vomit after every meal. The deceased had become very weak at the time of death. He died in his home.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "pain in stomach", "burning sensation since 6 months", "vomiting after meals since last 1 month", "became weak" and items from RHIME questionnaire.

Step 3: Chronology:

Upper GI Obstruction

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Stomach Cancer

Step 4: CoD is stomach cancer (C16).
Keywords that match the guidelines are bolded:
Vomiting*/ vomiting of blood.* ***Difficulty in swallowing*** *AND mass in upper abdomen AND any of the following:*

- ***Pain in abdomen***
- *Weight loss*
- *Enlarged liver*
- *Black stools*

OR Diagnosed as stomach cancer

Plus non-specific symptoms such as 'became weak' and the fact that it was a relatively short duration fatal illness

Step 5: Consider differential diagnoses: Peptic ulcer (K25-29)

Burning sensation in stomach is a favourable symptom but there is no history of improvement after being seen and treated in hospital.

Step 6: In this case, certainty of diagnosis is 1-High and the quality of narrative is 1-Good.

Answer 9: Male, 58 years old

Respondent thought patient died of "sugar ki beemari". He felt weakness. He was frequently passing urine. His mouth and tongue was automatically becoming dry. He was feeling pain in his knees. He was day by day becoming thin. Took him to [the doctor]. He, upon examining the patient, declared that the patient is sugar (diabetes) problem. He prescribed medications and the patient took these medicines for about two months. But there was no change then was took the patient to the hospital. They performed some tests and told us that the patient is diabetic. They prescribed medicines. He took these medicines but of no use. Brought him to hospital for 10 days, where doctors performed some tests. They too confirmed diabetes and prescribed some medicines and restrictions on food, etc. Taken for treatment but there was no change. His condition worsened and ultimately he passed away.

Step 1: Past history noted and narrative carefully read

Step 2: Keywords: "diagnosed diabetes at several clinics", "started on diet control and tablets", "no improvement" and items from RHIME questionnaire

Step 3: Chronology:

Diabetes

Step 4: CoD is diabetes (E11).

We are diagnosing diabetes as underlying cause of death rather than risk factor in this case because symptoms and diagnosis of diabetes are mentioned in narrative with no history of complications causing death

Step 5: Consider differential diagnoses: ischaemic heart disease (I20-25); stroke (I64), renal failure (N17-19)

Patient could have died due to any of these causes but no mention of symptoms or diagnosis mentioned in the narrative likely rules them out.

Step 6: In this case, the certainty of diagnosis is 1-High and the quality of narrative is 2-Poor (diabetes diagnosis to be followed up by history of complications along with history of terminal illness).

Answer 10: Female, 83 years old
Respondent thought patient died of "heart attack" and "old age". As reported by the respondent, the deceased was in old age and suffering from hypertension disease. She was under the treatment of several doctors. She has given high drugs but she could not tolerate these drugs. She was also involved by cough of long duration of more than six years. She spent sleepless night due to cough. Blood pressure remains higher than normal in various periods. Fever rose many days. Pain remains in aches more than 24 hours. Spread pain up to left arm and deep central chest. Due to cough she was associated with breathlessness, reduced urine amount also, burning with urine. Sometimes she fell unconscious. She fell seriously ill and could not talk. Due to high BP she passed away.

Step 1: Relevant past history noted and narrative carefully read.

Step 2: Keywords: "uncontrolled hypertension with fainting spells", "breathlessness for 6 years – nocturnal, associated with breathlessness", "cough > 6 yrs (chronic cough", "chest pain->24 hrs in left arm & chest", "fever", "reduced urine output and burning on micturation" and items from RHIME questionnaire

Step 3: Chronology:

Congestive Heart Failure

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COPD/Ischaemic Heart Disease/High BP

Step 4: CoD is congestive hart failure (I50).
Keywords that match the guidelines are bolded:
Progressive shortness of breath on lying down or at night*, improving on sitting up*
AND any of the following signs or symptoms:

- *Swelling of feet*
- *Distension of abdomen*
- ***Progressive cough***
- ***History of previous MI/ heart disease***

Step 5: Consider differential diagnoses: COPD (J40-47); urinary tract infection (N39)

Emphasis was given to the history of breathlessness at rest and breathlessness at night in a patient with long-standing cough to suggest that the underlying COPD probably led to the complication of heart failure which caused the death.

Less emphasis was also given the history of probable urinary tract infection in this case.
As can be seen, at older ages, it is more difficult to arrive at a probable cause of death based on the VA narrative in a person with multiple problems

Step 6: In this case, the certainty of diagnosis is 2-Low and the quality of narrative is 2-Poor (no temporal sequence or description of terminal illness on day of death).