Supplementary material

Case 1. Burns.

A 27-year-old male patient.

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| The patient was a 27-year-old male found at the scene of a fire. The initial cardiac rhythm was asystole; therefore, cardiopulmonary resuscitation (CPR) was performed for 3 minutes. Return of spontaneous circulation (ROSC) was subsequently achieved, and the patient was brought to an emergency room and admitted to the intensive care unit for therapeutic hypothermia. Initial brain computed tomography (CT) showed findings of hypoxic brain damage. A magnetic resonance imaging (MRI) of the brain on Day 3 after the completion of therapeutic hypothermia showed diffuse hypoxic ischemic encephalopathy suggestive of brain death.  Pulmonary edema improved after admission, and chest radiography conducted on Day 8 of hospitalization did not show any abnormal findings. Findings of pneumonia were identified on chest radiography on Day 9 of hospitalization, and *Acinetobacter baumanni* was identified. Oxygen saturation started to decrease while the patient was on different courses of antibiotics and monitoring and an arterial blood gas analysis (ABGA) showed findings in partial pressure of carbon dioxide (pCO2) of CO2 retention. No improvement was noted despite mechanical ventilation, and acidosis progressively worsened together with the onset of adult respiratory distress syndrome (ARDS). The patient became bradycardic and hypotensive and died on Day 14 of hospitalization. |

Case 2. Police water cannon.

A 69-year-old male patient.

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| The patient fell after he was hit by the police water cannon while he was pulling on a rope tied around a bus with other demonstrators in order to penetrate the police bus wall. The patient was brought to A University Hospital in an ambulance at 7:30 PM and underwent a 4-hour surgery for brain hemorrhage, but subsequently went into a mental coma and died on Day 317 of admission.  The death certificate was issued to certify this as a natural death. The attending physician argued that resuscitation was not impossible in the patient and stated that he obtained two do-not-resuscitate (DNR) permissions from the patient’s family as evidence for the family’s refusal for continuation of the patient’s treatment. The patient had a traumatic subdural hemorrhage (SDH) due to external force; he developed acute renal failure that was independent of the primary cause and subsequently developed hyperkalemia. According to the attending physician, the family members and caregivers declined active treatment, including hemodialysis, and the patient died of a cardiac arrest. Furthermore, the attending physician emphasized that the death certificate would have been different if the patient had died despite active life-sustaining treatment without the family’s treatment refusal. Officially, the police has accepted that the patient died of trauma from the water cannon. |

Case 3. Bedridden.

A 76-year-old female patient.

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| The patient had a traumatic epidural hemorrhage from a fall approximately 12 years ago, did not regain consciousness postoperatively, and had been admitted to a nursing hospital with a tracheotomy and Foley catheter in situ. The patient did not have any particular complications, such as pressure ulcers, and suddenly developed fever 4 days ago. Urinalysis showed pyuria, and *Escherichia coli* was identified on urine culture. The symptoms did not improve despite antibiotic treatment; the patient developed hypotension that was refractory to inotropics, and died subsequently. |

Case 4. Quadriplegia.

A 39-year-old male patient.

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| The patient was a quadriplegic who had sustained a cervical spine injury at age 17 after a fall from a 4-storey building in an attempted suicide. The patient was conscious and did not have any problem with communication. However, his physical movements were limited to slight finger movements. A Nelaton catheter was used to drain the urine.  Except for the past history of occasional acute pyelonephritis (APN) that necessitated hospitalization, the patient was able to maintain a daily routine and pursue his studies for more than 22 years. However, he presented to the hospital after 2 days of fever as the caregiver was absent, and he died a week later from APN-induced sepsis. |

Case 5. Traffic accident.

An 84-year-old female patient.

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| The patient presented with right upper arm pain. She reported that she was hit by a car near her apartment building and fell. Past medical and surgical history was negative except for hypertension. The vital signs were normal, she was conscious, and there was no abnormal laboratory finding.  A right humeral fracture was found on imaging. A cast was placed, and the patient was planned for follow-up by orthopedics. The patient presented to the orthopedics outpatient clinic 1 week later for follow-up X-ray, which did not show any abnormal findings.  Two days later, she presented to the emergency room with dyspnea. The caregivers reported that the patient was unable to eat much after the accident and systemically deteriorated. No abnormal finding was noted on a repeat chest X-ray.  At the time of emergency room presentation, the patient's saturation was 78% and the respiratory rate was 42/min. As the saturation remained low despite oxygen administration, the patient was intubated. While waiting for laboratory results, the patient had a cardiac arrest. Although CPR was performed, the patient died. The caregivers declined an autopsy. |

Case 6. Hepatic coma.

A 56-year-old male patient.

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| The patient was brought in an ambulance for altered mental status, and had earlier been diagnosed with alcoholic liver cirrhosis and was previously hospitalized several times for hepatic coma. The patient had not had any bowel movement since the preceding week. The daughter reported that the patient had fallen several times while returning from the bathroom with an unsteady gait 2 days ago but did not seem to have had sustained any serious head trauma from the falls.  At the time of presentation, the patient was unresponsive, and laboratory and imaging tests were subsequently conducted. Imaging showed a subdural hemorrhage (SDH), and laboratory investigations showed a pH of 6.9, ammonia of 312, elevated prothrombin time (PT) and activated partial prothrombin time (aPTT), and an international normalized ratio (INR) of 7. The patient was admitted to the neurosurgical intensive care unit and died 7 days later. |

Case 7. Anticoagulant.

A 78-year-old female patient.

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| At 8 PM on a Sunday, a 78-year-old female patient was brought to the emergency room in an ambulance with abrasions on her face, arms and legs with stable vital signs at the time of presentation. The patient seemed slightly drowsy, but was able to answer questions slowly. The emergency medical responder reported that a bystander called an ambulance when the patient fell on the street after she was hit by a car. The patient’s caregiver, who arrived later, reported that the patient was on antihypertensive medications and warfarin for hypertension and arrhythmia.  Laboratory findings showed hemoglobin of 8.0, PT 4.0, and aspartate transaminase/alanine transaminase 100/90, and other blood levels were normal. Chest CT showed a right 5th rib fracture and contusion of both lungs, and an abdominopelvic CT showed possible liver contusion and multiple subcutaneous hematomas. No other fracture was noted on imaging.  The patient’s level of consciousness diminished with declining saturation and she was intubated. RBCs were transfused due to decreased Hb, and conservative treatment with vitamin K and similar interventions was administered. Subsequently, increased bleeding was noted from abrasions, and progressive edema was apparent in the contused areas.  Despite conservative treatment upon admission to the intensive care unit, the patient’s condition declined progressively and alternated between deterioration and improvement, and eventually died on Day 56 of hospitalization. |

Case 8. Aspiration.

An 86-year-old female patient.

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| A patient who was a known hypertensive underwent brain surgery for spontaneous intracranial hemorrhage 3 years ago. She received hospitalized treatment for dementia and was admitted to a nursing home 12 months ago. The patient became progressively weaker and became bedridden due to impaired mobility. On the day of her death, the patient was having breakfast with the help of the nursing home staff when she developed dyspnea and died. Undigested food was noted in the airway on laryngoscopy conducted at the time of emergency room presentation, and postmortem imaging revealed findings of aspiration pneumonia. |

**1. For the patient in the case, how would you document the manner of death on the death certificate?**

① Unnatural ② Natural ③ Undetermined cause

**2. What do you think is the cause of death?**

(A) Immediate cause of death: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(B) Cause of (A): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(C) Cause of (B): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(D) Cause of (C): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3. For Case, please list the manner of death in the order of contribution.**

Unnatural (external) \_\_\_\_\_\_\_\_\_\_% + Natural (internal) \_\_\_\_\_\_\_\_\_\_%