APPENDIX 1

Case	Apparent diagnosis	Potential cognitive bias	Second (more serious) diagnosis	How TWED checklist helps
1	Anxiety disorder with possible secondary gain, acute gastroenteritis, food poisoning	**Search satisficing:** Participants may be satisfied with the diagnosis of stress-related anxiety disorder and satisfied that the patient was responsive to intravenous hydration for acute gastroenteritis. Hence, they do not seek an alternative diagnosis.	Acute myocardial ischaemia secondary to cocaine (sympathomimetic) intoxication	***T = What is the life/limb threat in this case?*** History of cocaine ingestion and chest discomfort should alert the participant to the possibility of sympathomimetic-induced myocardial ischaemia. ***D = What are the dispositional factors influencing your decision?*** Emotive disposition: the pestering for a medical leave certificate may elicit a repulsive response from the participant.
2	Stress-related tension headache	**Availability bias:** the relationship between neck pain and meningism (irrespective of cause) may not readily come to mind if the participant has not seen or read about meningism. **Search satisficing**: Participants may be satisfied with the pain score improvement after medications and do not seek an alternative diagnosis.	Meningism, secondary subarachnoid haemorrhage	***T = What is the life/limb threat in this case?*** The mere fact that the patient presents to the department in the early hours (3 am) should alert the participant that this could be something more sinister than a tension headache. The quality/nature as well as the severity of the headache, which was worse compared to previous headaches she experienced, should also alert the participant that this could be a red flag. ***W = What else? What if I am wrong****?* The fact that the patient developed neck pain the following morning is a red flag for meningism.
3	Acute coronary syndrome	**Search satisficing**: Participants may be satisfied with the diagnosis of acute coronary syndrome 'inherited' from the paramedic who performs the triage, hence do not seek an alternative diagnosis. **Availability bias**: Participants who only look at the absolute value of a vital sign, and are not in the habit of analysing its trend/dynamics by comparing the reading before and after may miss the significant drop in blood pressure. Participants who do not review the medications the patient is taking (e.g. beta-blocker) may miss the masking effect of beta-blocker on tachycardic manifestation.	Perforated viscus with acute haemorrhage/peptic ulcer bleeding	***T = What is the life threat?*** Epigastric tenderness + hypotension = the need to rule out perforated viscus/ peptic ulcer bleeding ***W = What else? What if I am wrong?*** The absence of appropriate tachycardia does not necessarily mean that the patient is not having acute haemorrhage, as he is taking beta-blocker.
4	Healed compression spinal fracture with osteophytes	**Anchoring and confirmation bias:** Participants who have anchored the diagnosis of healed compression fracture of the spine tend to associate the accident with the healed fracture as the cause of the current back pain. **Search satisficing:** Participants may be satisfied with the diagnosis offered by more authoritative personnel (i.e. the registrar in charge). **Availability bias:** Participants who are not in the habit of actively trying to correlate the clinical finding with the apparent abnormality found on the radiograph may miss the discrepancy between the sensory loss at the level of umbilicus (T10) with the L1 findings on the radiograph.	Acute progressive paraplegia from T10 level that demands further in-hospital investigations	***W = What else? What if I am wrong?*** The discrepancy between clinical finding and radiologic finding should demand a re-assessment. ***E = Do I have sufficient evidence to support this diagnosis?*** Again, if the participants slow down and attempt to correlate the clinical findings with the radiologic findings, there is no evidence to suggest that the current complaints of the patient are due to the L1 lesion.
5	Mild head injury	**Search satisficing:** Participants may be satisfied with the negative findings on skull radiography and her full Glasgow Coma Scale scores and hence do not seek an alternative diagnosis. **Confirmation bias**: Participants who have anchored the diagnosis of mild head injury may look for a negative skull radiograph to confirm their suspicion.	Headache and repeated episodes of vomiting are red flags to perform head computed tomography, especially for an elderly patient	***T = What is the life threat?*** Headaches + repeated episodes of vomiting + physiological/anatomical changes of the elderly = red flags for traumatic intracranial bleeding

APPENDIX 2

Case scenario 1

A man in his 20s presents to an emergency department complaining of acute shortness of breath and central chest discomfort for three hours prior to arrival. He appears anxious, sweaty and feverish. He had two episodes of diarrhoea and vomiting the night before, and claims that it could possibly be due to the curry noodle that he ate. He says that his assignment is due in three days' time and requests that the doctor gives him one day of medical leave.

His initial vital signs are: blood pressure 140/90 mmHg; pulse rate 140 beats/minute; temperature 39°C; and respiratory rate 30 breaths/minute. The paramedic at the triage counter tags him with a diagnosis of 'acute gastroenteritis' and treats him with 600 cc of normal saline 0.9%.

About half an hour later, when asked by the attending doctor, the patient says that he had a drink with his friends at a nightclub "*just to unwind from the stress of the job*". He admits to have consumed cocaine pills during the party. He also admits that he consumes cocaine "*on a regular basis*".

Except for mild chest discomfort, he says that he feels much better after the intravenous hydration and impatiently pesters the doctor to discharge him with one day of medical leave. The doctor finds no significant findings on physical examination.

Questions:

1. **If you were the attending doctor, would you have discharged him with a one-day medical leave certificate? Why or why not? (Total marks: 7)**

   Marking scheme:
   - Not ready for discharge (1 mark)
   - Give reason(s): e.g. persistent chest pain (1 mark), need to rule out coronary event (1 mark)
   - Give rationale/explanation: because of ingestion of cocaine (1 mark), cocaine results in catecholamine surge (1 mark); resulting in sympathetic over-activity and coronary artery vasoconstriction and spasm (1 mark)
   - What needs to be done: at least electrocardiography (1 mark)

   Note: No mark to be rewarded for this question if the student agrees to discharge the patient at this juncture without further investigation.

2. **List the diagnoses you should consider for this patient. (Total marks: 3)**

   Marking scheme:
   - Myocardial ischaemia/infarction (1 mark)*
   - Acute gastroenteritis (1 mark)
   - Anxiety disorder/malingering (1 mark)

   *May include other diagnosis that could be reasonably considered in this case. 'Myocardial ischaemia/infarction' must be included as an answer; otherwise, a maximum of 2 marks will be awarded.